

NAME OF APPLICANT: **Masa Mzantsi Cement (Pty) Ltd**

REFERENCE NUMBER: **KZN 30/5/1/2/2/ 10039MR**

SCOPING REPORT

**SUBMITTED WITH DUE REGARD TO
CONSULTATION WITH COMMUNITIES AND
INTERESTED AND AFFECTED PARTIES**

**AS REQUIRED IN TERMS OF REGULATION 49 OF THE MINERAL AND PETROLEUM
RESOURCES DEVELOPMENT ACT (ACT 28 of 2002), AND IN ACCORDANCE WITH THE
STANDARD DIRECTIVE FOR THE COMPILATION THEREOF AS PUBLISHED ON THE OFFICIAL
WEBSITE OF THE DEPARTMENT OF MINERAL RESOURCES.**



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Definitions

'consultation' means a two way communication process between the applicant and the community or interested and affected party wherein the former is seeking, listening to, and considering the latter's response, which allows openness in the decision making process.

'community' means a group of historically disadvantaged persons with interest or rights in a particular area of land on which the members have or exercise communal rights in terms of an agreement, custom or law: Provided that, where as a consequence of the provisions of the Act negotiations or consultations with the community are required, the community shall include the members or part of the community, directly affected by prospecting or mining, on land occupied by such members or part of the community.

'Interested and affected' parties include, but are not limited to;

- i. Host Communities
- ii. Landowners (Traditional and Title Deed owners)
- iii. Traditional Authority
- iv. Land Claimants
- v. Lawful land occupier
- vi. The Department of Land Affairs,
- vii. Any other person (including on adjacent and non-adjacent properties) whose socioeconomic conditions may be directly affected by the proposed prospecting or mining operation
- viii. The Local Municipality,
- ix. The relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project.

STANDARD DIRECTIVE

All applicants for, mining rights, in terms of the provisions of Section 29 (a) and in terms of Regulation 49 (4) of the Mineral and Petroleum Resources Development Act, directed to submit report strictly in accordance with the following format and subject headings, and as informed by the guideline posted on the Departments Official Website, within 30 days of notification by the Regional Manager of the acceptance of such application.

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1 Introduction and Background

1.1 Applicant details:

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2 The methodology applied to conduct scoping

2.1 Name the communities, or explain why no such community was identified.

The land upon which mining is proposed is privately owned but does abut tribal / municipally owned land administered by Madlebe Tribal Authority. They have and will continue to be consulted by the applicants through their leadership structure and ward councillors as applicable.

2.2 State whether or not the Community is also the landowner.

No. The land is privately held by PYLON PARK SUGAR ESTATE CC (Refer para 2.6).

2.3 State whether or not the Department of Land Affairs been identified as an interested and affected party

No. The land is privately owned.

2.4 State specifically whether or not a land claim is involved

None known at this stage, although the Land Claims Commissioner has been consulted.

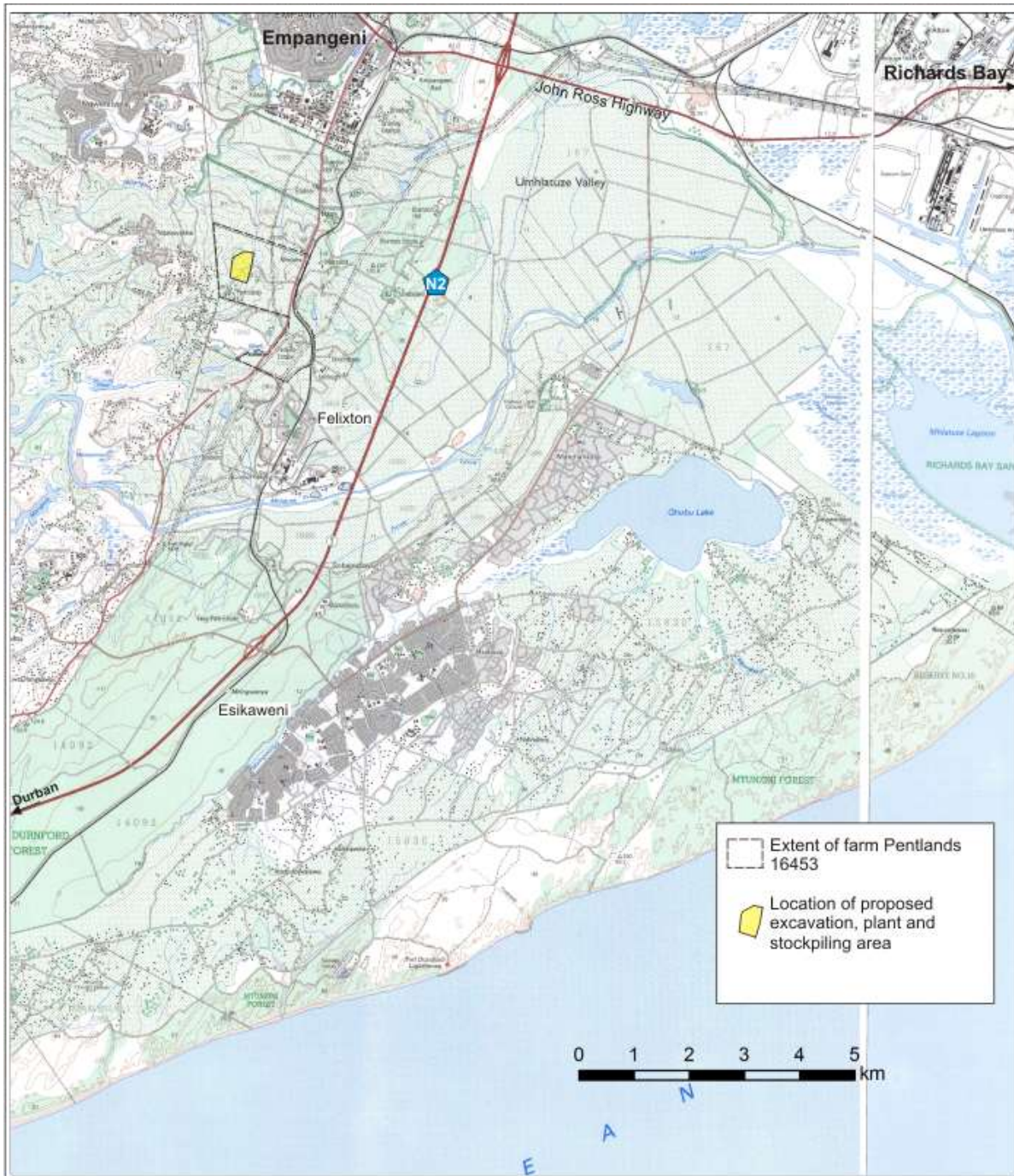


Figure 1: Locality Plan

2.5 Name the Traditional Authority identified by the applicant

The land to the west of the Mining Right area is occupied /administered by the Madlebe Traditional Authority under Chief Zungu.

2.6 List the landowners identified by the applicant. (Traditional and Title Deed owners)

The landowner details are as follows:

Farm name and number	Title Deed	Owner	Extent of farm
Pentlands 16453 Remainder	T9289/2008	Pylon Park Sugar Estate CC	180.1609ha

2.7 List the lawful occupiers of the land concerned

The land is occupied by the landowner (represented by Mr D Bell).

2.8 Explain whether or not other persons' socio-economic conditions will be directly affected by the proposed mining operation and if not, explain why not.

The three parties whose socio-economic condition will possibly be affected by the proposed operation are as follows – note that the extent of such impact must still be quantified and at this stage there is merely an acknowledgement of such socio-economic impact:

- The current landowner. Negotiation is still underway with the landowner regarding compensation by way of sale of land or rental based on sales of material against the sugar cane production on that portion of land. Note that whatever the outcome, 12.2ha of sugar cane land will be permanently lost to the excavation.
- The surrounding community will benefit from the proposed operation through guarantee by the applicant of the local staffing of the quarry as well as all the enforced benefits that accrue through the implementation of the Social and Labour Plan prescriptions which include skills development, capacity building and Local Economic Development through enforced audited Corporate Social Development.
- The last party that could possibly be affected is the existing Ninians quarry located to the south operated and owned by Lafarge South Africa. The extent of such impact will have to be explored further, perhaps through specialist study.

2.9 Name the Local Municipality identified by the applicant.

The local Municipality is the City of uMhlatuze. They have been included as Registered Interested and Affected Parties and have been sent documentation for their comment – Refer Annexure B. To date no acknowledgement of receipt has been received.

2.10 Name the relevant Government Departments, agencies and institutions responsible for the various aspects of the environment, land and infrastructure which may be affected by the proposed project.

The following government Departments, agencies and institutions have been identified thus far:

- Department of Environment Affairs, Dept. of Agriculture, Dept. of Water affairs
- Local Municipality: Municipal Manager
- Environmental Section of the Local Municipality
- Ezemvelo / KZN Wildlife
- SAHRA
- Ward Councillors of relevant wards

- Wildlife and Environment Society of South Africa (WESSA)
- Residents Association.
- Eskom (by virtue of location of powerline)
- SASOL (by virtue of location of pipeline)

This Scoping report will be dispatched to Government Departments of Water, Agriculture and Environment (amongst others) by the Department of Mineral Resources.

2.11 Confirm that evidence that the landowner or lawful occupier of the land in question, and any other interested and affected parties including all those listed above were notified, has been appended hereto.

Yes. Refer Annexure B for copies of all correspondence sent thus far. Also refer Annexure A for copy of text of a newspaper advertisement / notice placed in 5 local/ regional newspapers during the week of 8 July 2013:

- Zululand Observer
- Zululand Fever
- Umlozi Wezindaba
- Isolezwe
- iLanga

3 A description of the existing status of the cultural, socio-economic and biophysical environment, as the case may be, prior to the proposed mining operation; which description must include:

3.1 Confirm that the identified and consulted interested and affected parties agree on the description of the existing status of the environment.

Note that all I&AP's identified and corresponded with thus far were sent a copy of a Background Information Document. Such Background Information Document contained a description of the existing status of the environment. Furthermore, respondents were asked the following question in such document:

1. *Do you agree with the provided description of the status of existing biophysical environment (as described in para 5.2 to 5.14)?*

To date, no adverse responses to this have been received but any such comments which are received during further correspondence and the proposed Public Open Days will be reported on in the upcoming EMP.

Note that a copy of the BID was also made available on the Site Plan Consulting website (www.siteplan.co.za). We have not included copy of the BID in this document given the length of such document but it can be made available to any party at any time. The information presented therein is virtually the same as that presented in this scoping report.

3.2 Describe the existing status of any heritage environment that may be affected

A copy of this Scoping report will be despatched to SAHRA with request for them to make decision on the course of action required. Such documentation will all be included in the upcoming EMP.

3.3 Describe the existing status of any current land uses and the socio-economic environment that may be directly affected

The following land uses surround the proposed site (Refer Figure 2 below):

- The immediately surrounding land use consists of sugar cane farmlands with scattered remnant forest vegetation.
- The closest community is that of the Ndabayekhe community (Madlebe Tribal Authority under Chief Zungu) located to the east with some of that community within the target buffer of 500m. This will necessitate blast restrictions and control to allow blasting more than one shot hole at a time within 500m of any residence or structure. The Ninians quarry's excavation to the south is located within 200m of some of these residences.
- There are other farmsteads surrounding the site with only 3 of these on the eastern side of the R102. The farmstead inside the 500m target buffer zone will be used by the applicant as office. No farmsteads or labourer's cottages are within 500m of the proposed excavation.
- A cell mast is located on top of the hill 500m SW of the eventual excavation edge
- The R102 is located 900m east of the closest eventual excavation point with a rail line just east of the R102
- The Ninians quarry (operated by Lafarge) is located some 800m south of the eventual excavation
- In respect of powerlines the following is relevant:
 - The closest major powerlines (i.e. 2 x 88kV powerlines) are just within the 500m target buffer to the east of the excavation area
 - A minor powerline skirts the southern edge of the 500m target buffer zone. This line will most likely provide the Eskom power to this site and also supplies power to the cell mast
- There is a pipeline servitude registered approximately 400m SE of the eventual excavation edge. Such pipeline is a Sasol gas line and they have confirmed that there will be no impact at such distance (Refer Annexure C).
- The public road south of the excavation serving Ndabayekhe from the R102 has recently been realigned (assumed to be by the Ninians Quarry operators to allow for expansion of their pit).

- The farms potable water is stored in overhead grey tank on steel structure feeding green header tanks. This is fed from borehole to the south -Refer figure 6.

3.4 Describe the existing status of any infrastructure that may be affected.

As shown in figure 2 below, the following infrastructure is located within 500m of the eventual excavation extent:

- Cell tower located approx. 500m SW
- Pipeline servitude located about 400m east.
- A major powerline (2x 88kV lines) located 500m east of the eventual excavation extent
- A minor powerline (11kV) about 475m SE of the excavation
- A steel structure water tower west of the excavation.

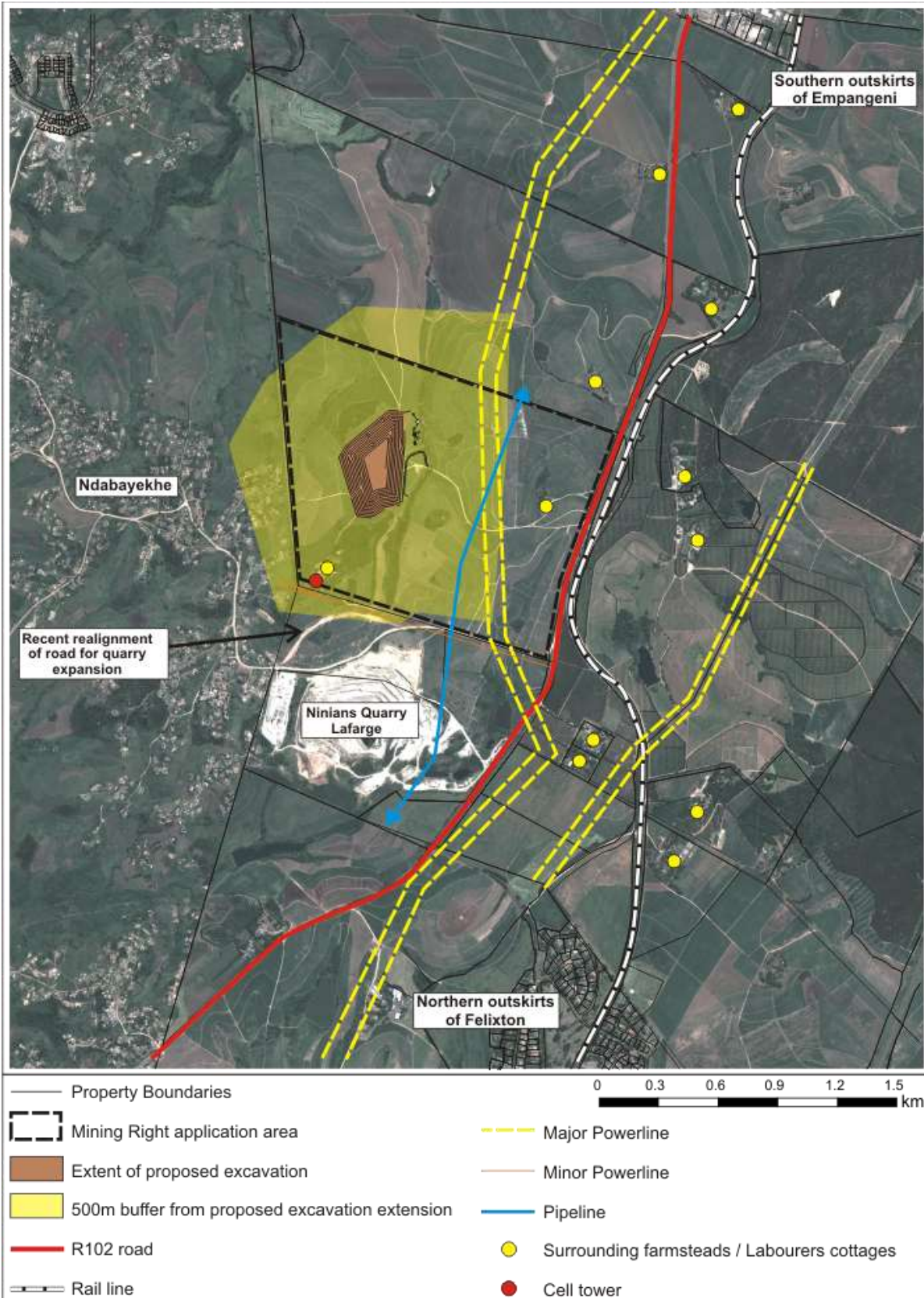


Figure 2: Surrounding Land Use

3.5 Describe the existing status of the biophysical environment that will be affected.

3.5.1 Topography

The site contours are as contained in figures 3 to 7. The photo below shows that proposed excavation to be located in an amphitheatre shaped area. The plant and stockpiling area is located in the flatter areas below.

Generally the surrounding topography consists of rolling hills typical of weathered granite environment.



Photo 1: Overview of site showing amphitheatre type topography

3.5.2 Visual Impact

Portions of the site is distantly (2.5km) visible from the R102 road users travelling south near the southern outskirts of Empangeni. Otherwise the site is well hidden from views as a result of natural ridgelines.



Photo 2: Visual exposure of the upper slopes from about 2-2.5km NNE

It is proposed that more detailed visual impact assessment be conducted for inclusion into EMP.

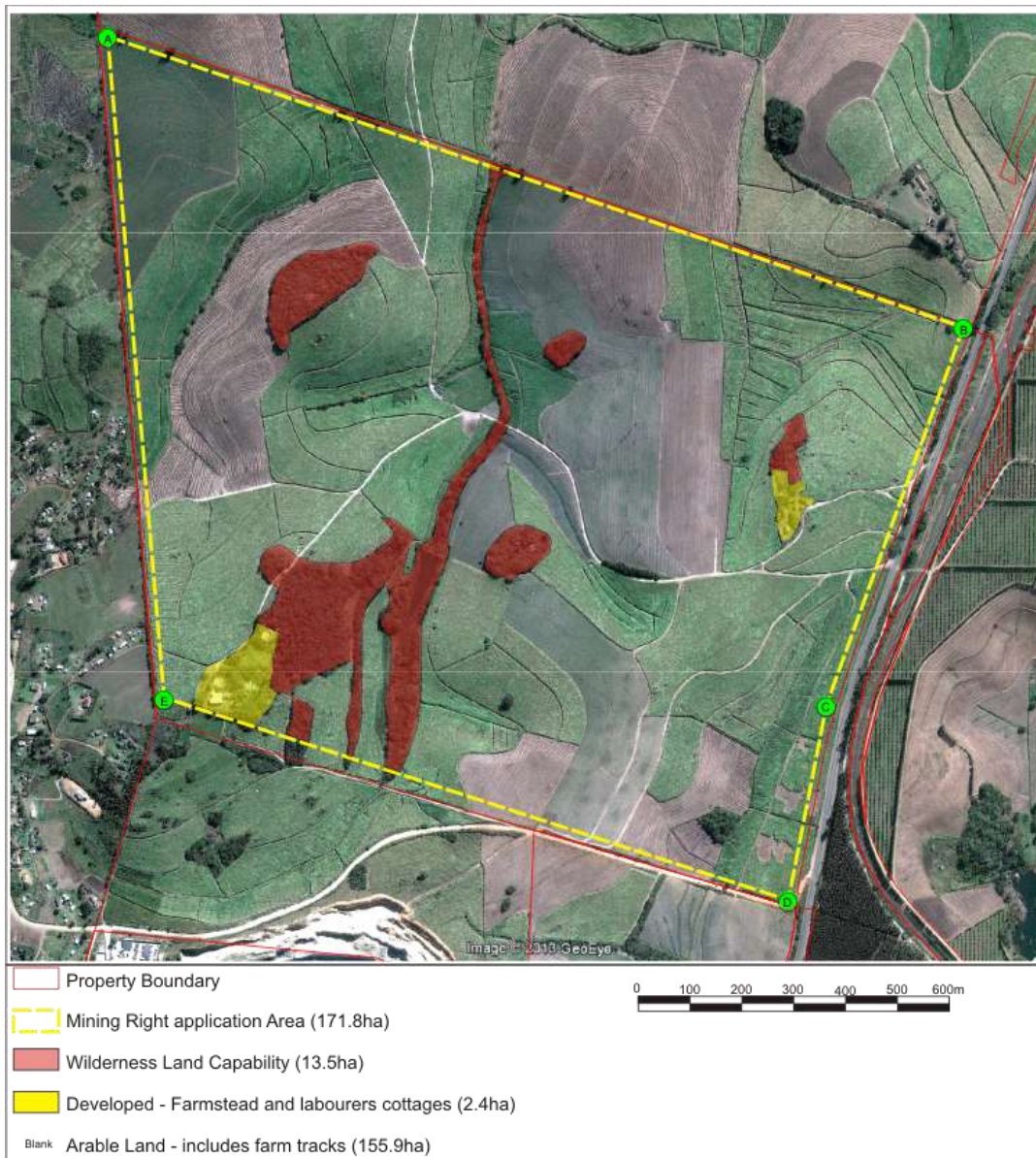
3.5.3 Soil

Soils vary in depth from zero (on the exposed granitic bedrock) to max 500mm deep..

3.5.4 Land Capability

The land capability of the entire Mining Right application area is as follows:

Land capability	Area	%
Wilderness area	13.5ha	7.9%
Arable Land	155.9ha	90.7%
Grazing	nil	0
Wetland Area ¹	nil	0
Developed area (Farmsteads and labourers cottages)	2.4ha	1.4%
Total	171.8ha	100%



¹ There are no wetlands on site but there are some stream channels. These have been classified as wilderness area.

3.5.5 Natural Vegetation

Proposed mining takes place in areas completely devoid of natural vegetation. However, the original vegetation is classified as Maputaland Coastal Belt by Mucina and Rutherford (2006)². Some stats in respect of that vegetation type are as follows:

Original area (ha)	Remaining area (ha)	% remaining	% protected	Target (%)	Ecosystem status	Protection level
402 486	276 812	69	11	25	Vulnerable	Poorly Protected

The closest protected areas are as shown in figure 5 below. Note that none of the protected areas or proposed expansion areas are within 10km of this proposed quarry. However, the KZN Systematic Conservation Plan compiled using land cover and vegetation type information, shows the site to lie within the area mapped as endangered in terms of the Conservation Status output map.

It is however clear when viewing the output map in Figure 4 below, that such conservation status has been very broadly applied and does not map lands which have already been disturbed. It applies to any *natural vegetation* within the polygon as mapped..

3.5.6 Animal Life

Vast expanses of the same vegetation surrounding the site provide a habitat suitable for species typical of the area. These include rodents (rats, mice, shrews etc.), reptiles (snakes) birds and insects. The large scale of the habitat type when compared to the extent of the proposed activities negate any significance of any impact in this regard.

² Mucina L and Rutherford MC (eds) 2006). *The vegetation of South Africa, Swaziland and Lesotho*. Strelitzia 19, SANBI, Pretoria.

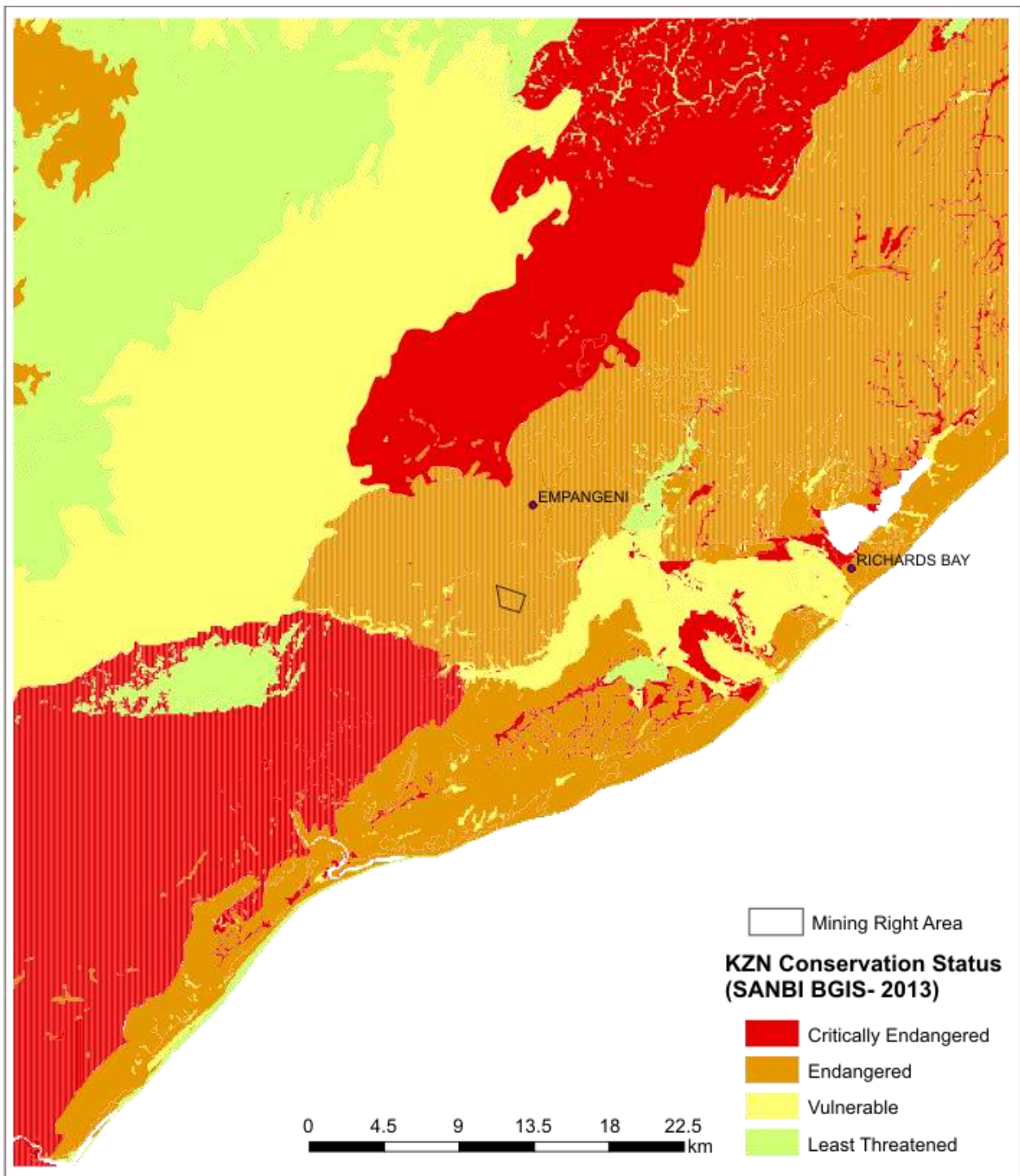


Figure 4: Site locality in context of the KZN Conservation Status database

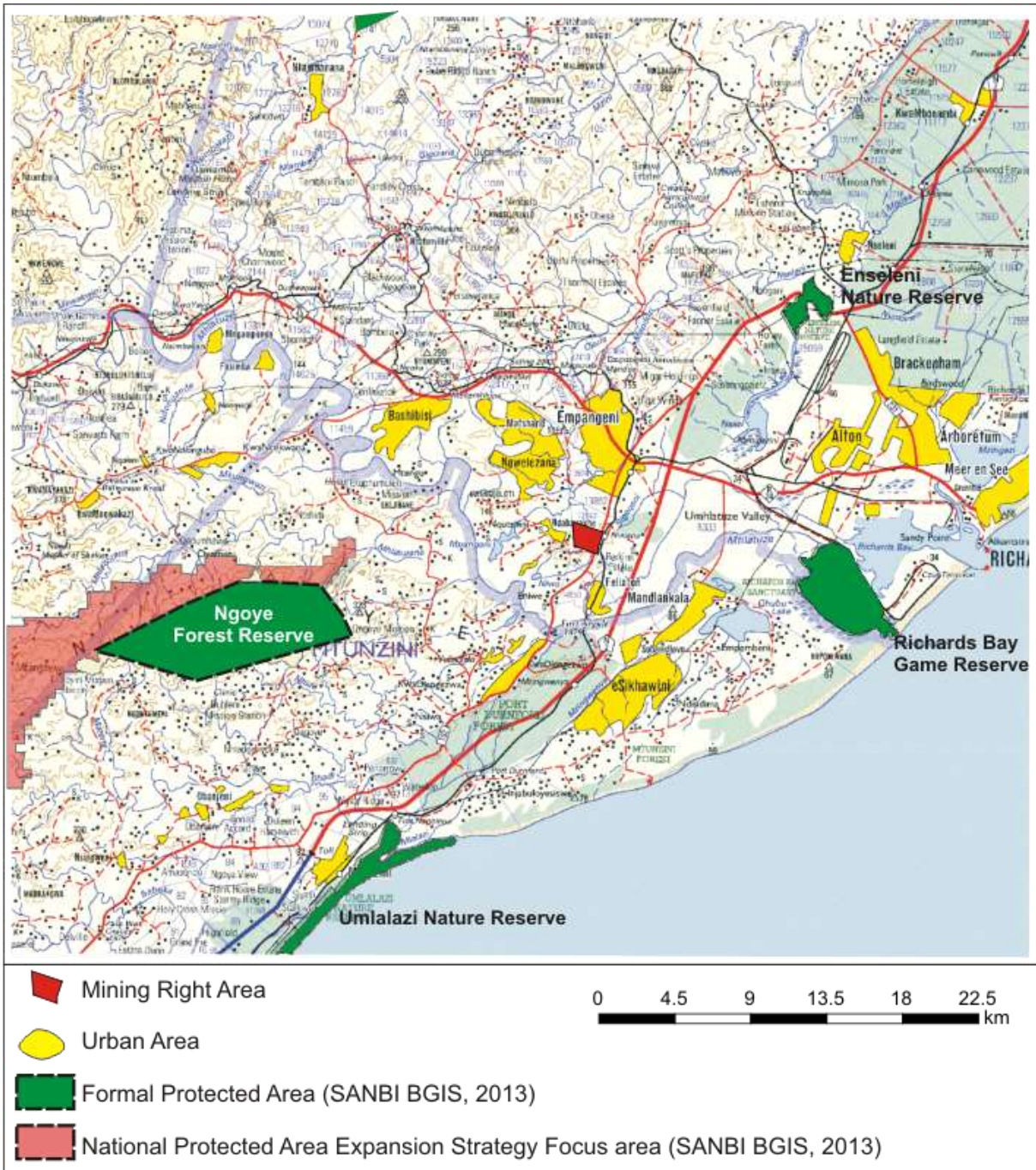


Figure 5: Site locality in context of surrounding Protected Areas

3.5.7 Surface Water

The site is located in quaternary basin W12F. No water will be withdrawn from any stream in the area. The following is applicable at this site:

1. The proposed excavation is located in an area which drains towards the Mpangeni River in the north
2. The excavation is located adjacent to a 2nd order tributary with a very short 3rd order tributary within the excavation area.
3. The photos after Figure 6 show the nature of these stream channels.

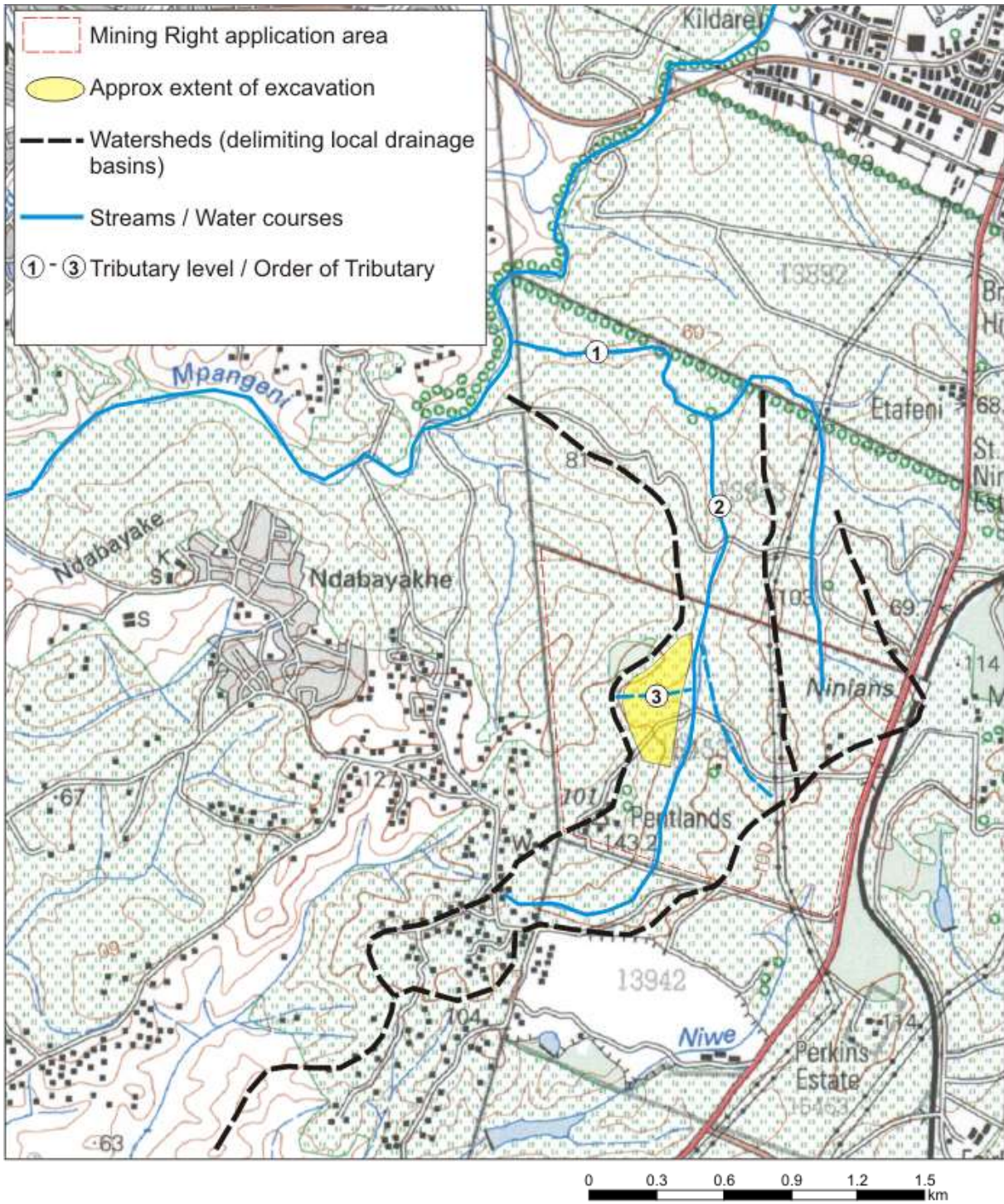


Figure 6: Surface Water regime

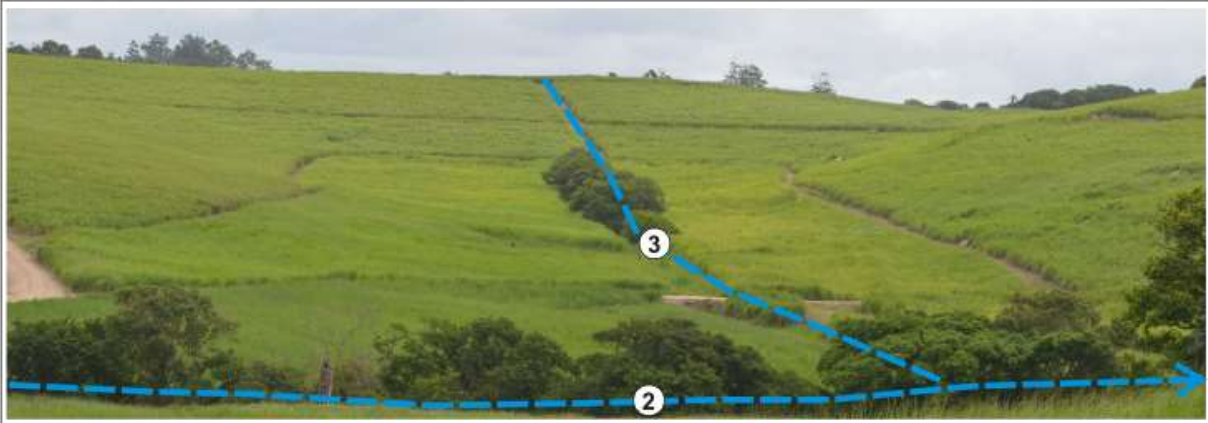


Photo 3: View of the site from the east showing the 3rd level tributary which will be removed through the proposed mining. The level 2 tributary in the foreground will not be impacted upon



Photo 4: Photos showing the state of the level 2 tributary upstream of the proposed quarry



Photo 5: State of the stream channel passing under the recently realigned road south of the proposed quarry

3.5.8 Ground Water

The site is located in quaternary basin W12F which allows for 750m³ groundwater to be withdrawn per hectare per year (over the entire farm) in accordance with General Authorisation in terms of Sections 21 (a) and (B) of the National Water Act (by way of Gazette 20526 dated 8 October 1999). Abstraction up to 750m³ requires registration of borehole but any groundwater abstraction above that rate requires licencing from DWA.

Note that drilling conducted prospecting to depths of 70m yielded no groundwater (Pers Comm, M Haslett, 2013). Note however that the bottom of the adjacent Ninians Pit (at estimated level 44m amsl (above mean sea level)) does have evidence of in-pit water. The proposed Pentlands Quarry has been planned with a floor level at 65m amsl after Phase 4 and then in Phase 5 long term plan to level 15m amsl. So groundwater may become an issue only in Phase 5. No dewatering licences / registration is deemed necessary at this stage given that more than 25 years will elapse before commencement of Phase 5.

3.5.9 Air Quality (Dust)

Attention is drawn to paragraph 4.8.4 of the extract from SANS regarding recognition that certain enterprises need to operate within “band 3” by virtue of “the practical operation of the enterprise...” provided that the best available control technology is applied for the duration”.

“DUST FALL STANDARDS SANS 1929:2004

4.8 Dust Deposition

4.8.1 General

The four-band scale to be used in the evaluation of dust deposition is given in 4.8.2 and target, alert and action levels indicated in 4.8.3. Permissible margins of tolerance are outlines in 4.8.4 and exceptions noted in 4.8.5

4.8.2 Evaluation Criteria for Dust Deposition

Dust deposition rates shall be expressed in units of mg m² day⁻¹ over a 30-day averaging period. Dust deposition shall be evaluated against a four-band scale as presented in Table 9.

Table 9 – Four-band scale evaluation criteria for dust deposition

Band number	Band description label	DUSTFALL RATE (D) (mg / m ² / day ¹ 30-day average)	Comment
1	Residential	D < 600	Permissible for residential and light commercial.
2	Industrial	600 < D < 1 200	Permissible for heavy commercial and industrial.
3	Action	1 200 < D < 2 400	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	2 400 < D	Immediate action and remediation required following the first exceedance. Incident report to be submitted to relevant authority.

4.8.3 Target, Action and Alert Thresholds are given in Table 10

Table 10 – Target, action and alert thresholds for dust deposition

Level	DUSTFALL RATE (D) (mg/ m ² /day ¹ 30-day average)	Averaging period	Permitted frequency of exceedances
Target	300	Annual	
Action residential	500	30 days	Three within any year, no two sequential months
Action industrial	1 200	30 days	Three within any year, no two sequential months.
Alert threshold	2 400	30 days	None. First exceedance requires remediation and compulsory report to authorities.

4.8.4 Margin of Tolerance

An enterprise may submit a request to the authorities to operate within Band 3 (ACTION Band), as specified in Table 9, for a limited period, providing that this is essential in terms of the practical operation of the enterprise (for example the final removal of a tailings deposit) and provided that the best available control technology is applied for the duration.

No margin of tolerance will be granted for operations that result in dustfall rates which fall within Band 4 (ALERT Band) as specified in Table 9.

4.8.5 Exceptions

Dustfalls that exceed the specified rates but that can be shown to be the result of some extreme weather or geological event shall be discounted for the purpose of enforcement and control. Such event might typically result in excessive dustfall rates across an entire metropolitan region, and not be localised to a particular operation. Natural seasonal variations, such as dry windy period during the Highveld spring will not be considered extreme events for this definition”

Richards Bay is an industrial hub and ambient air quality levels are compromised by pollutants with SO₂ and particulates (dust) being the main culprits (Petzer, 2009). These pollutants are however unlikely to have any impact on the air quality at the mining site given the wind regime (refer para 4.6.1).

At present, the ambient dust levels are low and any existing dust impact is the result of:

- Occasional vehicles on gravel roads in the area
- Very occasional ploughing of lands
- Mining activities surrounding the site.

The wind rose (para 4.6.1) shows that the wind vectors which predominate are from the South / Southwest and North / North east. It is noted that although there is some seasonal variation, the wind rose is fairly consistent for the entire year.

3.5.10 Noise

Current noise generating activities in the area are related to:

- Traffic
- General minimal farm related noise
- Existing mining activities to the south

3.6 Provide any relevant additional information.

3.6.1 Blast Vibration

It is noted that the South African Standard recommended maximum PPV is 12.5 mm/s. There has been no attempt to get information on any blast vibration monitoring from neighbouring quarry.

Assessment of Impact

The closest structures to the proposed blasting area are the surrounding (informal) communities residences located 265m west of the closest future blast (Phase 4).

While the transmissivity i.e. the capacity of the country rock to transmit blast vibration is probably similar to that of the transmissivity of Table Mountain Sandstone in which we have our most reliable blast vibration monitoring results, the table below shows that at 350m, structures would be at no risk.

Distance from blast	Expected recorded vibration level at respective distances PPV in mm/s (peak particle velocity)	USBM (United States Bureau of Mines) recommended limit
350m	3-6 mm/s	10 mm/s
700m	2 mm/s	10 mm/s

Impact Level and EIA Requirement

There is unlikely to be any impact as a result of blast vibration, however be that as it may, it is recommended that further investigation into this aspect be included in the EMP

3.6.2 Fly Rock

Fly rock is generally acknowledged as being a potential impact within a radius of up to 500m. In this case there are several informal residences within this 500m buffer with the closest residence being 265m from the closest blast (at end of Phase 2). The adjacent Ninians quarry excavation is located within 200m of surrounding residences.

4 Identification of the anticipated environmental, social or cultural impacts, including the cumulative impacts, where applicable.

4.1 Provide a description of the proposed project including a map showing the spatial locality of infrastructure, extraction area, & any associated activities.

This application is for a mining right to develop hard rock drill and blast surface mine with on-site processing (crushing & screening) plant.

4.1.1 General Mining Method and Site Layout Plan

Mining (quarrying) will occur as a drill and blast operation with faces of 9-11m high and a blast size of 20 000 – 30 000 tons/blast, approximately once per month, with such drilling and blasting will be conducted by contractor. The drilling of holes by hydraulic track rig and the computer controlled blast detonation system represents the latest quarrying technology. Ahead of the face blasting, topsoil (where available outside of exposed bedrock) is removed to topsoil stockpile berms for later use in rehabilitation.

Shot rock is loaded by excavator into articulated dump trucks for hauling to the processing plant for crushing and screening of sizes to meet market requirements. The proposed phasing of the excavation development is as shown in figures 7-11 below.

Phase 1 is the establishment phase and consists of location of all facilities as well as construction of the plant, preparation of stockpiling area. It also includes excavation establishment as a cut into the hill in the NE corner of the proposed pit. The proper development of haul road access point to the pit (adit) is critical as it will be used for the entire life of mine.

Phase 2 represents the westward expansion of the Phase 1 pit with a floor level still at 75m. Note once again the location of the haul roads in a permanent position. Phase 2's southern advance is limited by the drainage ditch.

Phase 3 is the southward advance of the pit across the drainage ditch and the lowering of the floor by 1 bench to level 65m. A second haul road is developed at this stage

Phase 4 continues the southward advance until the final southern pit edge is reached as shown in figure 6 with the floor still at level 65m.

Phase 5 is the lowering of the entire floor by a further 6 benches to level 15m.

The volume of material obtained in each phase is included in each phase drawing as well as proposed topsoil handling.

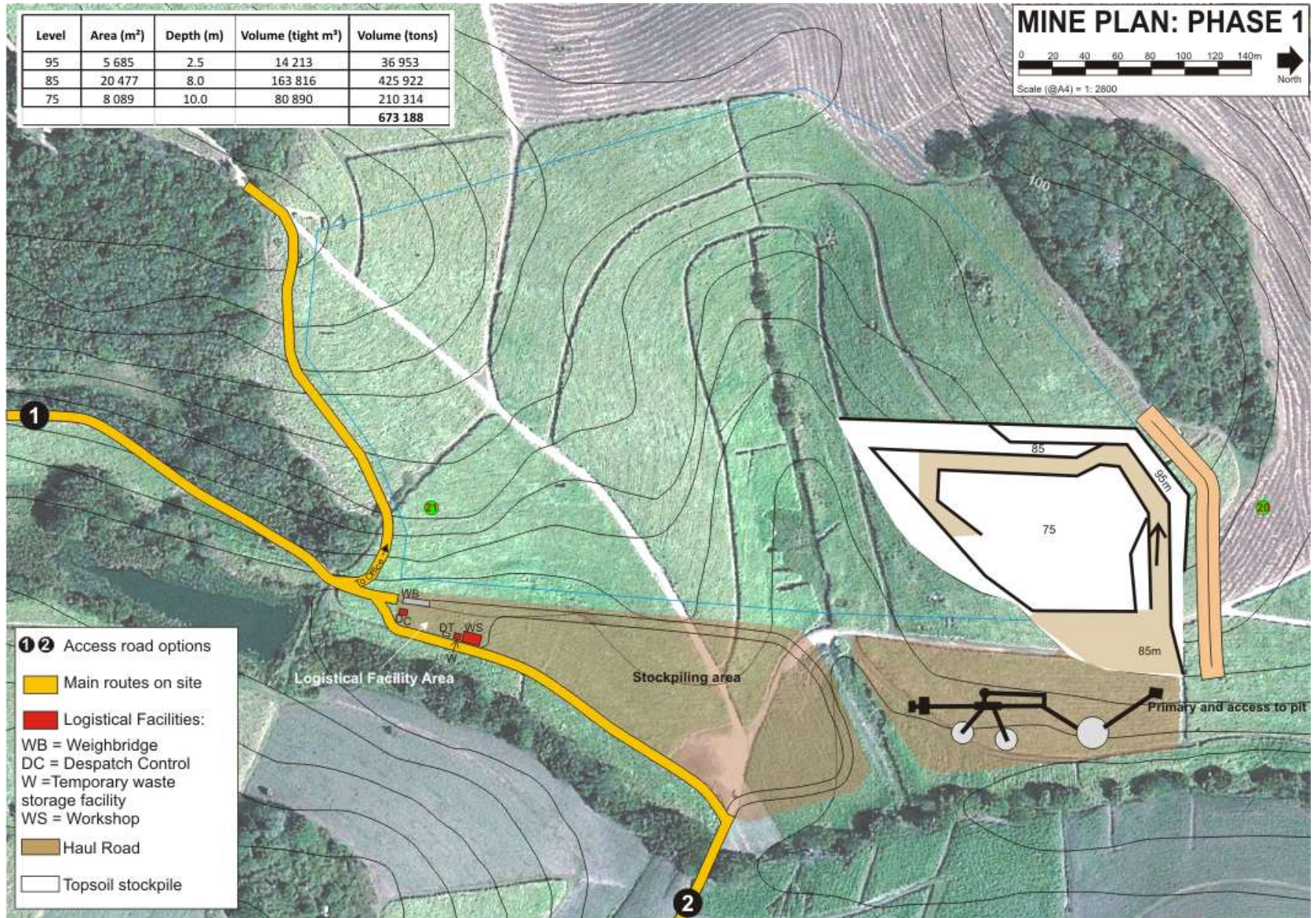


Figure 7: Mine Layout Plan: Phase 1

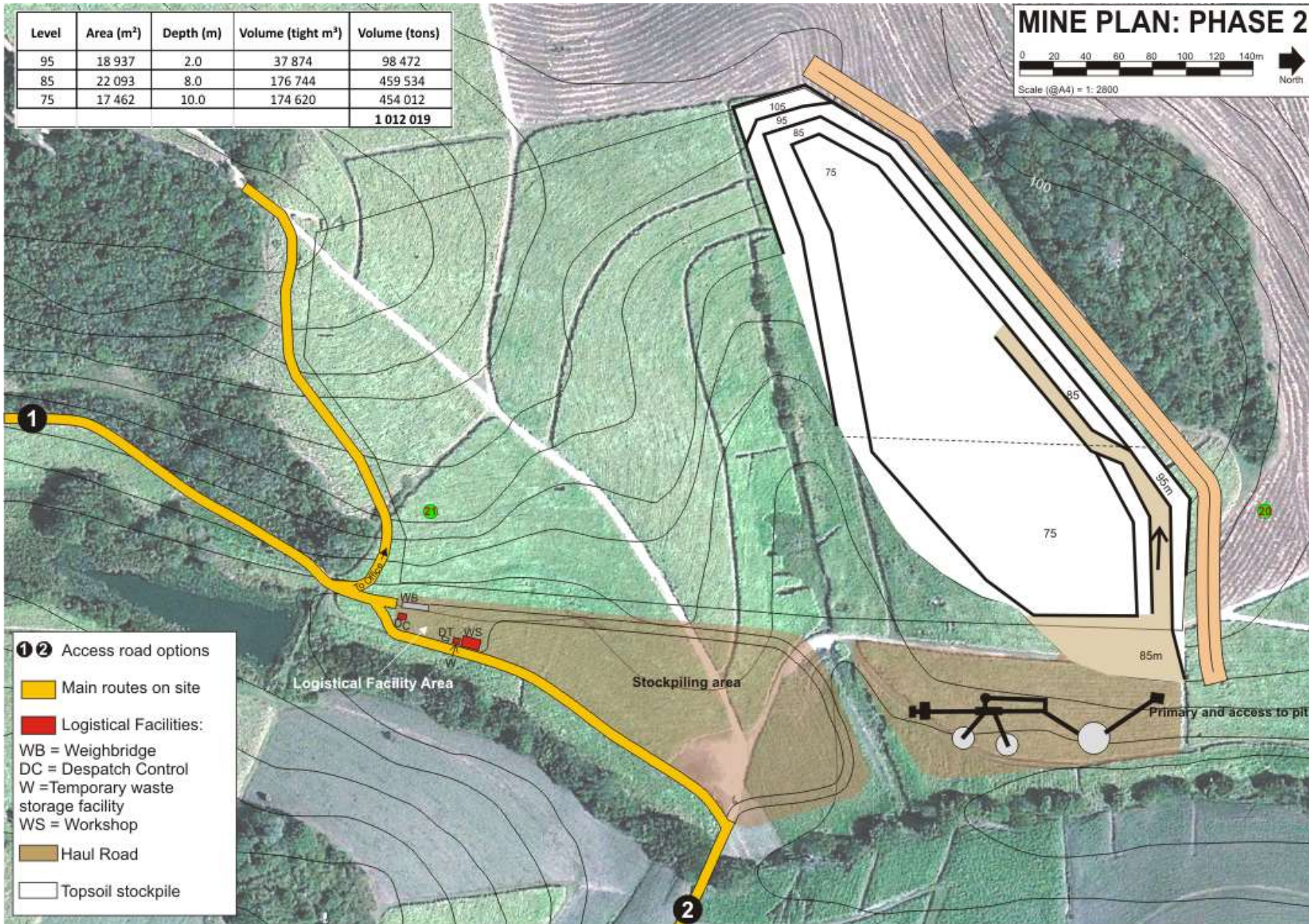


Figure 8: Mine Plan: Phase 2

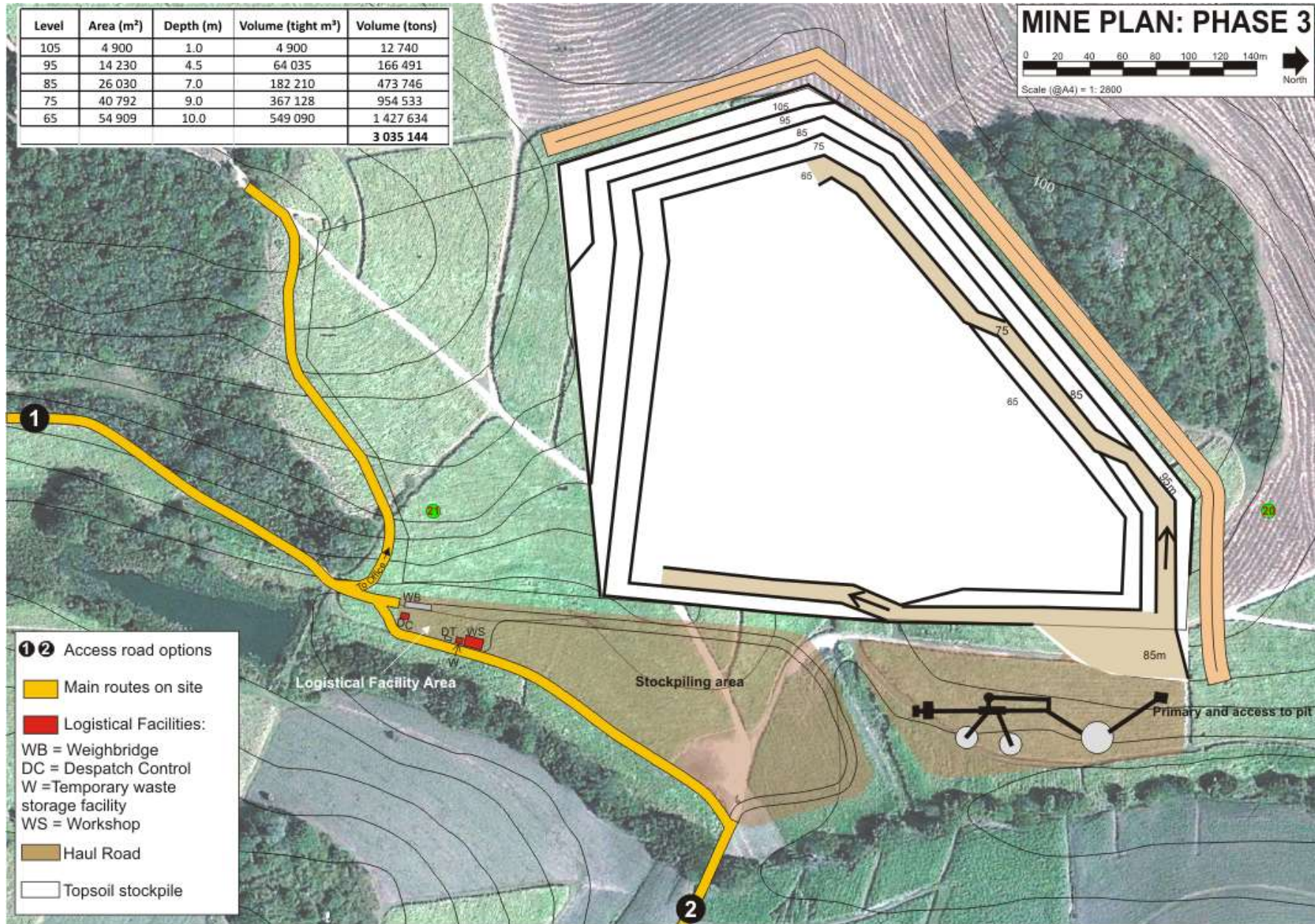


Figure 9: Mine Plan: Phase 3

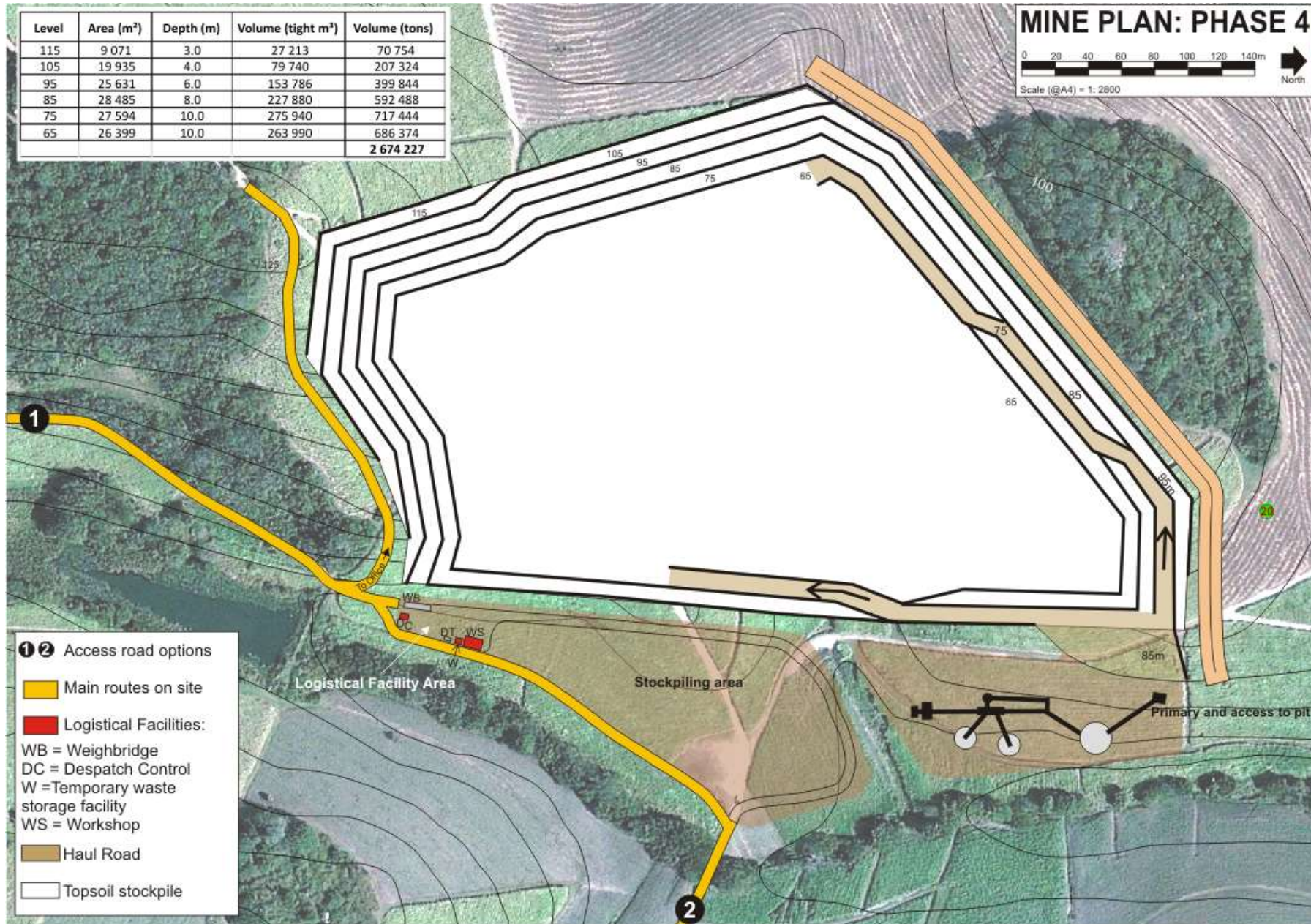


Figure 10: Mine Plan Phase 4

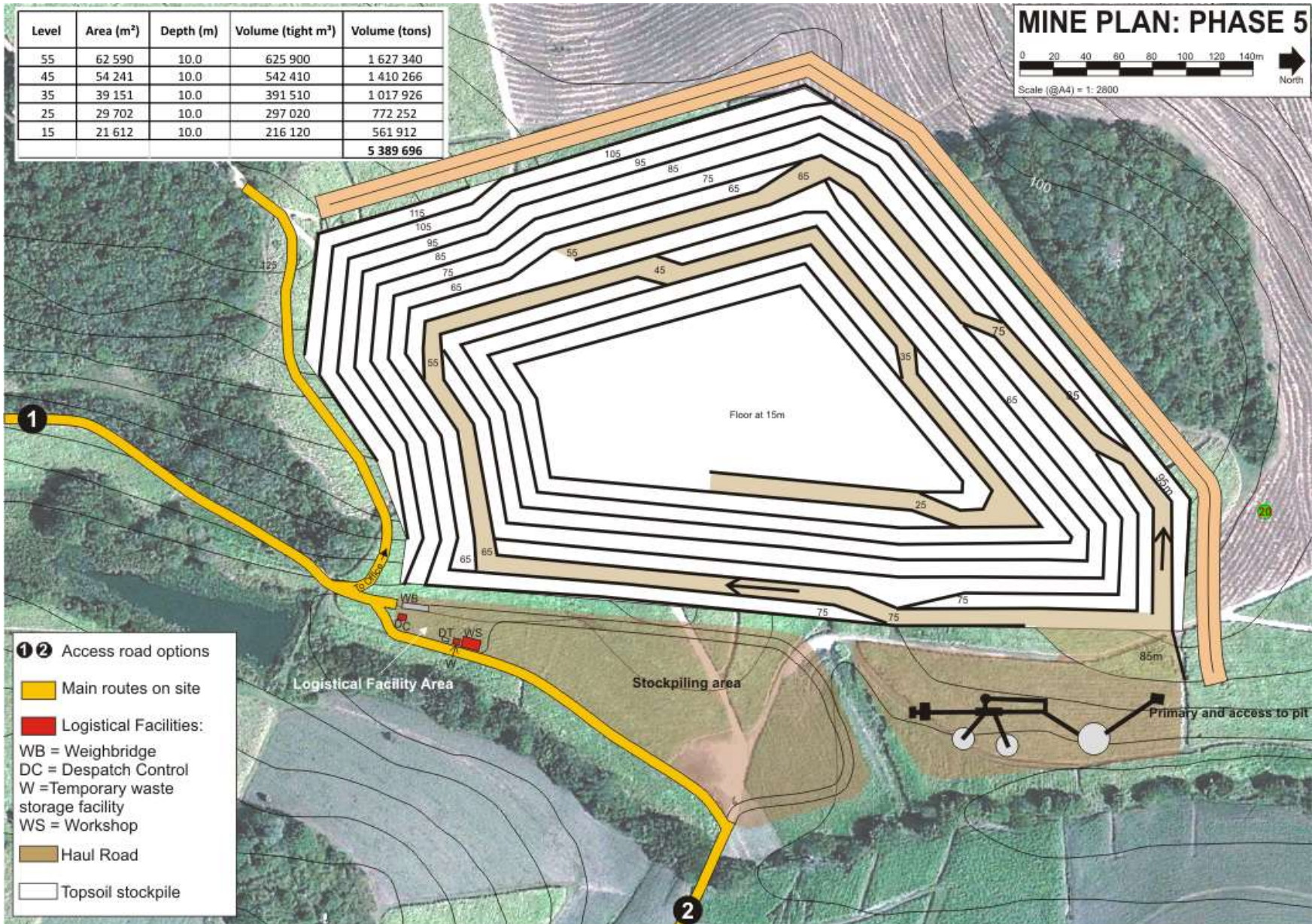


Figure 11: Mine Plan: Phase 5

So the list of activities proposed at the site consists of the following:

Activity
1. PRE- ESTABLISHMENT ACTIVITIES
1.1. Approvals (Pre-establishment)
1.2. Site Survey to place facilities
1.3. Demarcate Mining Right area & No-Go areas and danger sign posting
2. ESTABLISHMENT ACTIVITIES
2.1. Upgrade selected access road
2.2. Provide chemical toilets for site establishment staff
2.3. Supply header tanks
2.4. Connect to water supply from header tank to logistical facilities
2.5. Place Genset (until Eskom power supply connected)
2.6. Remove topsoil to berms in Logistics area
2.7. Remove topsoil to berms in Plant and Stockpiling area
2.8. Construct Primary Ramp
2.9. Construct haul road to excavation
2.10. Construct / Place Container for office and store
2.11. Place personnel amenities container
2.12. Construct Workshop with oil trap
2.13. Construct bunded fuel storage tank
2.14. Construct domestic and industrial waste collection point
2.15. Construct wash bay with oil trap
2.16. Cast concrete footings for crushing plant
2.17. Erect Crushing plant
2.18. Construct weighbridge
2.19. Establish stormwater management system
2.20. Initiate induction environmental training of staff
2.21. Install mist sprays on plant
2.22. Conduct post establishment Environmental Performance Assessment (EPA)
3. OPERATIONAL PHASE ACTIVITIES
3.1. Topsoil removal to perimeter stockpile ahead of face advance
3.2. Drilling
3.3. Blasting
3.4. Loading of shot rock
3.5. Hauling of shot rock
3.6. Crushing and screening of shot rock
3.7. Stockpiling of product
3.8. Loading of product for delivery
3.9. Use of workshop
3.10. Use of Refuelling Facility
3.11. Use of access/delivery road to the site
4. OPERATIONAL PHASE MONITORING AND REHABILITATION ACTIVITIES
4.1. Monitor fly rock during and after blasting
4.2. Record blast ground and air vibration
4.3. Monitor dust blowing in direction of surrounding residents/communities
4.4. Conduct EPA (bi-annually)
4.5. Maintain stormwater system
4.6. Maintain dust control sprinklers on plant
4.7. Maintain access/delivery road

Activity
4.8. Collection of waste bins
4.9. Enforce no-go area access
4.10. Decontaminate floors and diesel tank
4.11. Operational Rehabilitation - upper perimeter face splitting (only after phase 4)
5. DECOMMISSIONING PHASE ACTIVITIES
<i>Complete rehabilitation of the excavation through:</i>
5.1. Conduct upper bench splitting of hard face
5.2. Retain safety fence and berm around top of excavation rim
5.3. Allow excavation floor to flood as reedbed
5.4. Retain haul road access
<i>Complete rehabilitation of the logistical facility, plant and stockpiling area through:</i>
5.5. Demolish all unrequired structures
5.6. Remove all process plant and steel structures
5.7. Remove all protruding foundations and footings
5.8. Remove all pipelines and cables
5.9. Remove ramp to bottom of pit
5.10. Remove diesel tank & decontaminate
5.11. Remove weighbridge concrete structures
5.12. Rip / scarify all hardened areas
5.13. Replace Topsoil ex berms in the plant and logistics area
5.14. Replace Topsoil ex berms in stockpile area
5.15. Re-vegetate plant & logistics area by seeding
5.16. Seed stockpile area
5.17. Retain stormwater management system
5.18. Retain access roads for future use
6. AFTERCARE PERIOD
6.1. Maintain stormwater management system
6.2. Remove alien vegetation (if applicable)
6.3. Conduct supplementary seeding if necessary
6.4. Conduct final performance assessment
6.5. Lodge closure Application
6.6. DME Grant Closure Application

Table 1: List of activities

4.1.2 Mining Rate, Reserves and Lifespan

The following table reflects the calculated volumes based on Figures 7-11. Detail volume calculation is also included in each of the figures. The lifespan is based on sales of 300 000 tons per annum at full production.

	Volume (tight m³)	Volume (tons)	Lifespan (years)
Phase 1	258 919	673 188	3.5
Phase 2	389 238	1 012 019	3.4
Phase 3	1 167 363	3 035 144	10.1
Phase 4	1 028 549	2 674 227	8.9
Phase 5	2 072 960	5 389 696	18.0
Total	4 917 029	12 784 274	43.9

4.2 Describe any listed activities (in terms of the NEMA EIA regulations) which will be occurring within the proposed project.

The following activities represent listed activities which could in theory be applicable to the mine. Progress / alterations to this are as contained in “comment” column where applicable:

In terms of Listing Notice 1 (i.e. No.R. 544):

Listing #	Description	Comment
11	Construction of(ii) channels.... where such construction occurs within 32 m of a watercourse...	The proposed mining will remove a surface water channel (all the way to the top of the valley).
22	Construction of any road where no road reserve exists and the road is wider than 8m	Unlikely but must be borne in mind when specifying construction phase activities.
23	Transformation of vacant land to... industrial use, outside urban area where total area to be transformed is bigger than 1ha but less than 20ha	Yes. The excavation will measure 12.2ha in total. The logistical facility, plant and stockpiling disturbance areas will measure 3.1ha.
56	Phased activities	

Table 2: Possible listed activities (Listing notice 1)

In terms of Listing Notice 2 (i.e. No.R. 545):

Listing #	Description	Comment
15	Physical alteration of vacant land for ... industrial use where total area to be transformed is 20ha or more.	No. Total disturbance area = 15.3ha
20	Any activity which requires a mining right	Yes

Table 3: Possible listed activities: Listing Notice 2

In terms of Listing Notice 3 (i.e. No. R. 546) for KZN:

Listing #	Description	Comment
4	Construction of a road wider than 4m ... outside urban areas in <ol style="list-style-type: none"> 1. Protected area as identified in NEMPAA 2. National protected area expansion strategy focus areas 3. Sensitive areas in terms of Env. Management Framework adopted by competent authority 4. Sites identified by international convention 5. Critical Biodiversity areas 6. Core biosphere areas 7. Within 10km of national park/world heritage site of 5km from Protected area or biosphere core 	No roads must be constructed to wider than 4m. The proposed access roads already exist but will require upgrading.

Listing #	Description	Comment
10	Construction of facilities... for storage of ... dangerous good... combined capacity of 30m ³	Unlikely that storage will exceed 30m ³ on this site but must be specified
12	The clearance of an area of 300m ² or more of vegetation where 75% or more of the cover constitutes indigenous vegetation... in a CBA identified in bioregional plan	No. The excavation area is not in CBA
13	The clearance of an area of 1ha or more of vegetation where 75% or more of the cover constitutes indigenous vegetation... in a sensitive area as identified in an EM framework as contemplated in Chapter 5 of the (NEM)Act and adopted by the competent authority	Uncertain. Does the excavation area fall within a defined sensitive area – to be clarified. It does fall within the “endangered” classification in the KZN Systematic Conservation Plan
19	Widening of existing road by more than 4m ... outside urban areas in Critical Biodiversity areas... or in sensitive area	Any roads widened by more than 4m – none planned at this stage but would have to be specified as such
26	Phased activities	Excludes mining

Table 4: Possible listed activities: Listing notice 3

4.3 Specifically confirm that the community and identified interested and affected parties have been consulted and that they agree that the potential impacts identified include those identified by them.

Yes. Identified I&AP’s and the community was consulted. Annexure B includes copies of all correspondence sent.

Note that all I&AP’s identified and corresponded with thus far were sent a copy of a Background Information Document. Such Background Information Document contained a description of the existing status of the environment. Furthermore, respondents were asked the following question in such document:

2. *Do you agree with the potential impacts on biophysical environment identified as a result of the proposed mining (as described in para 5.2 to 5.14 and Part 6)?*

To date, only one response to this has been received by Ninians Quarry operators Lafarge South Africa. Copy of such comment is contained in Annexure C but is copied below:

....., we would like the following to be considered in your study:

- Review of all detailed studies and report regarding the proposed development
- All correspondence related to the project, including all invitations to public consultation meetings
- Detailed motivation of the need for an additional aggregates operator in the area (qualitative study), considering that are already other aggregates suppliers in the area
- Detailed assessment of potential **cumulative** impacts of all environmental, including but not limited to:

- noise
- dust
- water
- socio-economic aspects
- Detailed socio-economic impact study will have to be undertaken in relation to the impact of the project on the socio-economic environment of the area and the neighbouring communities

Note also that SASOL have confirmed that the proposed quarry will have no impact on their gas pipe line.

Note that a copy of the BID was also made available on the Site Plan Consulting website (www.siteplan.co.za). We have not included copy of the BID in this document given the length of such document but it can be made available to any party at any time. The information presented therein is virtually the same as that presented in this scoping report.

Public participation continues and these issues will be updated / added to in the upcoming EMP:

4.4 Provide a list and description of potential impacts identified on the cultural environment.

4.4.1 Provide a list and description of potential impacts identified on the heritage environment, if applicable.

None to date, but this scoping report will be dispatched to SAHRA for their decision on any studies that will be required. Note that it is highly unlikely that any artefacts of archaeological significance remain after such intense agricultural use of the land for decades. In addition no paleontological fossils / remains are possible in these gneissic granites.

4.5 Provide a list and description of potential impacts identified on the socio-economic conditions of any person on the property and on any adjacent or non-adjacent property who may be affected by the proposed mining operation.

4.5.1 Impacts

Refer also para 2.8 which lists potential impactees and states that socio-economic specialist study may be required to determine impact on surrounding quarries. Such study will be included in EMP if deemed necessary.

Additionally the following potential impacts (may) arise as follows through the proposed activities:

Negative

- Potential impacts on farm integrity: Poaching, stock theft, stock loss (through roadkill or gates being left open), security, and road condition deterioration.

Note however that stock concerns are generally not applicable in these sugar cane lands

- Potential impacts on rural settlements: Raise false levels of expectancy, economic concerns if mine labour are paid more than farm labour, immigration of workers, drugs etc.

Positive

- Potential for infrastructure development
- Potential for employment opportunity.
- The applicant company is bound by prescriptions of the Social and Labour Plan to contribute to the community's skills development and must also implement a Local Economic Development project which meets the satisfaction of the DMR and local authority.
- The social and labour plan also prescribes skills development for staff and community members.

4.5.2 Attenuation measures

The following measures will be implemented to limit the negative impacts:

- Only security personnel will be housed on site after hours
- All staff will be warned of the consequences (police referral and dismissal) for poaching and stock theft (if applicable) and conditions will be inserted into their employment contracts in this regard
- Stock security in terms of closure of gates, maintenance of water supply to watering troughs etc., will be discussed at weekly production/safety meetings (if applicable).

It must be noted that the potential for socio-economic upliftment as a result of this mining authorisation is large, given the minimum 30 year time frame of the proposed activities and the fact that social and labour plan requirements will ensure:

1. Job creation of at the very least 28 new jobs and several more indirect jobs in the local community where unemployment is particularly high
2. Corporate social responsibility is enforced through implementation of LED project.
3. Skills development is enforced through ABET, tertiary level bursaries for staff and community members, school support, Learnerships and apprenticeship training for staff and community members, mentoring programme, special attention placed to increasing numbers of women in mining, and more
4. Procurement progression plan to ensure continuous supply of goods and services from local and BEE companies
5. Plan to manage the effects of downscaling or retrenchments (if applicable).

4.5.3 Provide a list of potential impacts (positive & negative) on: employment opportunities, community health, community proximity, and links to the Social and Labour Plan.

Employment opportunities:

The proposed quarry will provide up to 28 direct job positions and several indirect job opportunities.

Community Health and Community Proximity:

The proposed excavation is located fairly close (with the closest point of excavation at 265m to the closest residence) and it would be expected that impacts on community health and nuisance impact would be high, but this is not the case given:

- The location of the excavation and plant beyond a major ridgeline
- The use of modern and restricted blasting (particularly when within 500m from a residence)
- The predominant wind regime which precludes any dust impact on that community – refer para 4.6.1 for full discussion on the aspect of dust)
- Blasting will only take place approximately once per month and will take place at an advertised time to minimise startling effect of such blast – refer para for further discussion of blast vibration and flyrock.

Links to Social and Labour Plan:

The community will benefit from the following initiatives as prescribed in the Social and Labour Plan:

1. School support for community learners
2. Bursaries for tertiary education (for community members)
3. Internships on the mine for community members
4. Mining related Learnerships for community members
5. Corporate Social Investment by applicant is enforced through the Social and Labour Plan. The applicant must implement a community upliftment project in the job creation, infrastructure and / or social spheres.

4.6 Provide a list and description of potential impacts identified on the biophysical environment including but not be limited to impacts on: flora, fauna, water resources, air, noise, soil etc.

This section describes the impact of the proposed mining programme. The impacts are rated according to nature, extent, duration, probability of occurring and significance.

a) The significance level is based on the following criteria:

<i>Significance</i>		<i>Criteria</i>
Negative	Significant (S)	<ul style="list-style-type: none"> ● Recommended level always exceeded with associated widespread community action ● Disturbance to areas that are pristine, have conservation value, are important resource to humans and will be lost forever ● Complete loss of land capability ● Destruction of rare or endangered specimens ● May affect the viability of the project

	Moderate (M)	<ul style="list-style-type: none"> • Moderate measurable deterioration and discomfort • Recommended level occasionally violated – still widespread complaints • Partial loss of land capability • Complete change in species variety or prevalence • May be managed • Is insignificant if managed according to EMP provisions
	Minor/ (I) Insignificant	<ul style="list-style-type: none"> • Minor deterioration. Change not measurable • Recommended level will rarely if ever be violated • Sporadic community complaints • Minor deterioration in land capability • Minor changes in species variety or prevalence
	Negligible	<ul style="list-style-type: none"> • An impact will occur but it is barely discernible and not worthy of further investigation
Positive	Minor	<ul style="list-style-type: none"> • Improvements in local socio-economics
	Significant	<ul style="list-style-type: none"> • Major improvements in local socio-economics with some regional benefits

- b) The **duration** is classified as
- Permanent (post-closure)
 - Life of Mine (LOM)
 - Temporary

- c) The **probability** is ranked as
- Definite/Certain
 - Possible
 - Unlikely

Activity	Nature of impact	Extent	Duration	Probability	Significance
1. PRE- ESTABLISHMENT ACTIVITIES					
1.1. Approvals (Pre-establishment)					
1.2. Site Survey to place facilities					
1.2.1. Land Capability	Placing of facilities as per plan	Mining Right area	Life of Mine	Definite	Positive (Insignificant)
1.3. Demarcate Mining Right area & No-Go areas and danger sign posting					
1.3.1. Land Capability	Placing of beacons to demarcate activity areas	Mining Right area	Life of Mine	Definite	Positive (Insignificant)
2. ESTABLISHMENT ACTIVITIES					
2.1. Upgrade selected access road	May require widening of sections of existing road				

Activity	Nature of impact	Extent	Duration	Probability	Significance
2.1.1. Topsoil	Limited topsoil removal; will be required should road widening/ construction be required	Unknown but will be minor in currently cultivated lands	Life of Mine	Probable	Insignificant
2.1.2. Visual	Sections of access road may be visible from other public roads	Minor	Life of Mine	Possible	Insignificant
2.1.3. Land Capability	Sections of currently cultivated areas will be disturbed	Minor	Life of Mine	Probable	Insignificant
2.1.4. Animal Life	Disturbance of habitat (in cultivated lands)	Minor	On execution	Unlikely	Insignificant
2.1.5. Noise	Earthmoving equipment	Local	On execution	Definite	Insignificant
2.1.6. Air Quality	Dust generated by earthmoving equipment	Local	On execution	Definite	Insignificant
2.1.7. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.2. Provide chemical toilets for site establishment staff					
2.2.1. Surface Water	Possible leakage	Local	On execution until cleaned	Possible	Insignificant
2.2.2. Groundwater	Possible leakage	Local	On execution until cleaned	Unlikely	Insignificant
2.3. Supply header tanks					
2.4. Connect to water supply from header tank to logistical facilities					
2.5. Place Genset (until Eskom power supply connected)					
2.5.1. Noise	Earthmoving equipment	Local	On execution	Definite	Insignificant
2.5.2. Air Quality	Dust generated by earthmoving equipment	Local	On execution	Definite	Insignificant
2.5.3. Hydrocarbons	Possible oil/fuel leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.6. Remove topsoil to berms in Logistics and stockpiling area					
2.6.1. Topsoil	1.9ha area topsoil to be removed to berms	1.9ha @ 15cm deep = 2850m ³	Life of Mine	Definite	Moderate
2.6.2. Land Capability	1.9ha cultivated area lost to activities	1.9ha	Life of Mine	Definite	Insignificant

Activity	Nature of impact	Extent	Duration	Probability	Significance
2.6.3. Vegetation	No natural vegetation will be disturbed	1.9ha	NA	NA	None
2.6.4. Animal Life	Disturbance of habitat (in cultivated lands)	Minor	On execution	Unlikely	Insignificant
2.6.5. Noise	Earthmoving equipment	Local	On execution	Definite	Insignificant
2.6.6. Air Quality	Dust generated by earthmoving equipment	Local	On execution	Definite	Insignificant
2.6.7. Archaeology	Possible disturbance of artefacts	1.9ha	Permanent	Highly unlikely given cultivation	To be assessed by specialist if deemed so by SAHRA
2.6.8. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.7. Remove topsoil to berms in Plant area					
2.7.1. Topsoil	1.3ha area topsoil to be removed to berms	1.3ha @ 15cm deep = 1950m ³	Life of Mine	Definite	Moderate
2.7.2. Land Capability	1.3ha cultivated area lost to activities	1.3ha	Life of Mine	Definite	Insignificant
2.7.3. Vegetation	No natural vegetation will be disturbed	1.3ha	NA	NA	None
2.7.4. Animal Life	Disturbance of habitat (in cultivated lands)	Minor	On execution	Unlikely	Insignificant
2.7.5. Noise	Earthmoving equipment	Local	On execution	Definite	Insignificant
2.7.6. Air Quality	Dust generated by earthmoving equipment	Local	On execution	Definite	Insignificant
2.7.7. Archaeology	Possible disturbance of artefacts	1.3ha	Permanent	Highly unlikely given cultivation	To be assessed by specialist if deemed so by SAHRA
2.7.8. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.8. Construct Primary Ramp					
2.8.1. Topography	Typical ramps up to 5m ³ high with retaining wall to intake hopper	From surface to 5m high over an area of ±250m ²	Will remain for life of mine	Definite	Insignificant
2.8.2. Visual	May be visible from R102	From distance of 2km and more if at all	Life of mine	Possible	Negligible
2.8.3. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant

³ Size of ramp determined by site contours

Activity	Nature of impact	Extent	Duration	Probability	Significance
2.8.4. Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.9. Construct haul road to excavation					
2.9.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
2.9.2. Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.9.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.10. Construct / Place Container for office and store					
2.11. Place personnel amenities container					
2.12. Construct Workshop with oil trap					
2.12.1.Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
2.12.2.Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.12.3.Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.13. Construct banded fuel storage tank					
2.13.1.Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
2.13.2.Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.13.3.Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.14. Construct domestic and industrial waste collection point					
2.14.1.Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
2.14.2.Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.14.3.Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.15. Construct wash bay with oil trap					
2.15.1.Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant

Activity	Nature of impact	Extent	Duration	Probability	Significance
2.15.2.Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.15.3.Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.16. Cast concrete footings for crushing plant					
2.16.1.Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
2.16.2.Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.16.3.Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.17. Erect Crushing plant					
2.17.1.Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
2.17.2.Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.17.3.Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.18. Construct weighbridge					
2.18.1.Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
2.18.2.Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.18.3.Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.19. Establish stormwater management system					
2.19.1.Surface Water	Will prevent siltation of natural water resources	Local and downstream	Life of Mine	Definite	Insignificant to moderate (Positive)
2.19.2.Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
2.19.3.Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
2.19.4.Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
2.20. Initiate induction environmental training of staff	Positive attenuation measure				

Activity	Nature of impact	Extent	Duration	Probability	Significance
2.21. Install mist sprays on plant	Positive attenuation measure				
2.22. Conduct post establishment Environmental Performance Assessment (EPA)	Positive attenuation measure				
3. OPERATIONAL PHASE ACTIVITIES					
3.1. Topsoil removal to perimeter stockpile ahead of face advance	Until end phase 4 after which topsoil can be replaced on upper benches				
3.1.1. Topsoil	Topsoil removed to average 15cm deep ahead of face of advance	In 40mstrips ahead of mining advance	Until at least end Phase 4	Definite	Moderate
3.1.2. Visual	Visual scarring of denuded surface will be visible against surrounding sugar cane	Upper portion of excavation from ±2km away to southbound road users of R102	Until end of Phase 4	Probable	Insignificant ⁴
3.1.3. Land Capability	Cleared area will not be available for cultivation	Eventually 12.2ha (at end Phase 4)	Permanent	Definite	Insignificant (small scale)
3.1.4. Vegetation	No natural vegetation will be disturbed	12.2ha	NA	NA	None
3.1.5. Animal Life	Disturbance of habitat (in cultivated lands)	Minor	On execution	Unlikely	Insignificant
3.1.6. Noise	Earthmoving equipment	Local	On execution	Definite	Insignificant
3.1.7. Dust	Dust generated by earthmoving equipment	Local	On execution	Definite	Insignificant
3.1.8. Archaeology	Possible disturbance of artefacts	12.2ha	Permanent	Highly unlikely given cultivation	To be assessed by specialist if deemed so by SAHRA
3.1.9. Hydrocarbons	Possible oil/fuel leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
3.2. Drilling					
3.2.1. Noise	Drilling Noise	Local will be reflected to east by topography	On execution	Definite	Insignificant
3.2.2. Dust	Generated by drill	Local	On execution	Definite	Insignificant

⁴ Visual impact to be re-assessed prior to EMP compilation

Activity	Nature of impact	Extent	Duration	Probability	Significance
3.2.3. Hydrocarbons	Possible oil/fuel leak	Local	On execution	Definite	Insignificant
3.3. Blasting / Quarry advance					
3.3.1. Geology	Removal of 4.9mill m ³ granitic material	12.2ha surface area	Permanent	Definite	Negligible
3.3.2. Topography	Excavation development in hard rock	12.2ha surface area to depth of between 60m in east and 110m in SW	Permanent	Definite	Moderate to significant
3.3.3. Visual	Upper western faces may/will be visible from R102 just outside Empangeni	Distant views of upper faces	Will decrease in time as faces weather and vegetate	Possible – to be fully assessed prior to EMP	Moderate to Insignificant
3.3.4. Land Capability	12.2ha cultivated area lost to activities	12.2ha	Life of Mine	Definite	Insignificant
3.3.5. Surface Water: Quantity 1	Loss of surface run-off contribution to 2 nd order tributary (12.2ha)	12.2ha	Permanent	Definite	Insignificant
3.3.6. Surface Water: Quantity 2	Removal of 3 rd order tributary from system (over 290m)	190m	Permanent	Definite	Insignificant
3.3.7. Groundwater: Quantity	Possible exposure of groundwater. Could lead to drawdown	Unknown – to be assessed			
3.3.8. Noise	Blast noise	Mine area and beyond	At blasting time	Definite	Moderate (given houses 290m away from closest blast)
3.3.9. Dust	Blast dust	Mine area and beyond	At blasting time	Definite	Insignificant given wind vectors
3.3.10. Blast Vibration	Blast vibration as sub surface waves can cause damage to structures if excessive	Potential impactees: - Portion of community to west - Powerline pylons - Cell mast - Water tower	Damage at time of blasting	Highly unlikely	Potentially significant
3.3.11. Fly rock	Damage to structures and potential loss of life	Community to west and structures nearby	Damage related to blasting	Highly unlikely	Significant
3.4. Loading of shot rock					
3.4.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant

Activity	Nature of impact	Extent	Duration	Probability	Significance
3.4.2. Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
3.4.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
3.5. Hauling of shot rock					
3.5.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
3.5.2. Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
3.5.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
3.6. Crushing and screening of shot rock					
3.6.1. Visual	Dust also causes visual impact	May/will be visible from R102 just outside Empangeni	Whilst crusher and screens operational under dry conditions	Probable	Insignificant
3.6.2. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
3.6.3. Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
3.6.4. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
3.7. Use of mist sprays on plant					
3.7.1. Water Use	Ground or surface water (quarry sump) use	Minor volumes	Whilst crusher and screens operational under dry conditions	Definite	Insignificant
3.7.2. Air Quality	Reduction in dust levels	Local (and reduction in visual outside of Mining Right area)	Whilst crusher and screens operational under dry conditions	Definite	Positive (Insignificant)
3.8. Stockpiling of product					
3.8.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
3.8.2. Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant

Activity	Nature of impact	Extent	Duration	Probability	Significance
3.8.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
3.9. Loading of product for delivery					
3.9.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
3.9.2. Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
3.9.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment	Local	On execution until cleaned	Possible	Insignificant
3.10. Use of workshop					
3.10.1. Hydrocarbons	Potential for leakage from vehicles and spare parts etc.	Localised	Until clean up	Possible	Insignificant
3.11. Use of Refuelling Facility					
3.11.1. Hydrocarbons	Potential for leakage onto natural soils	Local (but up to 15 000l)	Until clean up	Will not happen – fuel tanks banded	Moderate
3.12. Use of access/delivery road to the site (and other unsurfaced roads)					
3.12.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
3.12.2. Dust	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
3.12.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment/vehicles	Local	On execution until cleaned	Possible	Insignificant
3.12.4. Traffic / Access	Increased heavy vehicle traffic	45 trucks per day ⁵	Life of Mine during working hours	Most likely	Moderate
4. OPERATIONAL PHASE MONITORING AND REHABILITATION ACTIVITIES					
4.1. Monitor fly rock during and after blasting	Monitoring is an impact reduction measure. As such it has a positive impact.				
4.2. Record blast ground and air vibration	Monitoring is an impact reduction measure. As such it has a positive impact.				

⁵ Assume 25ton trucks: 3000 00tons per annum = 25 000tons/month / 22days = 1136tons/day / 25ton trucks = 45 trucks per day in an area where quarry trucks are common occurrence

Activity	Nature of impact	Extent	Duration	Probability	Significance
4.3. Monitor dust blowing in direction of surrounding residents/ communities	Monitoring is an impact reduction measure. As such it has a positive impact.				
4.4. Conduct EPA (bi-annually)	Monitoring is an impact reduction measure. As such it has a positive impact.				
4.5. Monitor and Maintain stormwater system	Monitoring is an impact reduction measure. As such it has a positive impact.				
4.6. Monitor and Maintain dust control sprinklers on plant	Monitoring is an impact reduction measure. As such it has a positive impact.				
4.7. Monitor and Maintain access/delivery road	Monitoring is an impact reduction measure. As such it has a positive impact.				
4.8. Collection of waste bins	Is an impact reduction measure				
4.9. Enforce no-go area access	Is an impact reduction measure				
4.10. Decontaminate floors and diesel tank	Is an impact reduction measure				
4.11. Operational Rehabilitation - upper perimeter face splitting (only after phase 4)					
4.11.1. Topography	Shaping of upper faces to maximise revegetation potential and safety	Upper 10m bench	Permanent	Definitely	Insignificant (Positive)
4.11.2. Topsoil	Topsoil replaced over split benches	All benches	Permanent	Definite	Insignificant
4.11.3. Visual	Vegetation will grow on replaced topsoil hiding faces behind them	All benches but especially upper western and south-western benches	Permanent	Definite	Moderate to Insignificant ⁶
4.11.4. Land Capability	Allows for wilderness rating to be applied	Entire excavation (eventually)	Permanent	Definite	Insignificant
5. DECOMMISSIONING PHASE ACTIVITIES					
<i>Complete rehabilitation of the excavation through:</i>					
5.1. Complete upper bench splitting of hard face					

⁶ Visual impact to be re-assessed before EMP

Activity	Nature of impact	Extent	Duration	Probability	Significance
5.1.1. Topography	Shaping of upper faces to maximise revegetation potential and safety	Upper 10m bench	Permanent	Definitely	Insignificant (Positive)
5.1.2. Topsoil	Topsoil replaced over split benches	All benches	Permanent	Definite	Insignificant
5.1.3. Visual	Vegetation will grow on replaced topsoil hiding faces behind them	All benches but especially upper western and south-western benches	Permanent	Definite	Moderate to Insignificant ⁷
5.1.4. Land Capability	Allows for wilderness rating to be applied	Entire excavation (eventually)	Permanent	Definite	Insignificant
5.2. Retain safety fence and berm around top of excavation rim					
5.3. Allow excavation floor to flood as reedbed					
5.4. Retain haul road access					
<i>Complete rehabilitation of the logistical facility, plant and stockpiling area through:</i>					
5.5. Demolish all unrequired structures					
5.5.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
5.5.2. Air Quality	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
5.5.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment/vehicles	Local	On execution until cleaned	Possible	Insignificant
5.6. Remove all process plant and steel structures					
5.6.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
5.6.2. Air Quality	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
5.6.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment/vehicles	Local	On execution until cleaned	Possible	Insignificant

⁷ Visual impact to be re-assessed before EMP

Activity	Nature of impact	Extent	Duration	Probability	Significance
5.7. Remove all protruding foundations and footings					
5.7.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
5.7.2. Air Quality	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
5.7.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment/vehicles	Local	On execution until cleaned	Possible	Insignificant
5.8. Remove all pipelines and cables					
5.9. Remove ramp to bottom of pit					
5.9.1. Topography	Ramp removed	±250m ²	Permanent	Definite	Insignificant
5.9.2. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
5.9.3. Air Quality	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
5.9.4. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment/vehicles	Local	On execution until cleaned	Possible	Insignificant
5.10. Remove diesel tank and decontaminate					
5.11. Remove weighbridge concrete structures					
5.12. Rip / scarify all hardened areas					
5.12.1. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
5.12.2. Air Quality	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
5.12.3. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment/vehicles	Local	On execution until cleaned	Possible	Insignificant
5.13. Replace Topsoil ex berms in the logistics and stockpiling area and revegetate					
5.13.1. Topsoil	1.9ha area topsoil to be replaced from berms	1.9ha @ 15cm deep = 2850m ³	Permanent	Definite	Moderate
5.13.2. Land Capability	1.9ha area available for cultivation or as wilderness	1.9ha	Permanent	Definite	Insignificant
5.13.3. Vegetation	Will be seeded with vegetation	1.9ha	Permanent	Definite	Insignificant
5.13.4. Animal Life	Habitat returned	Minor	Permanent	Definite	Insignificant

Activity	Nature of impact	Extent	Duration	Probability	Significance
5.13.5. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
5.13.6. Air Quality	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
5.13.7. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment/vehicles	Local	On execution until cleaned	Possible	Insignificant
5.14. Replace Topsoil ex berms in Plant area and revegetate					
5.14.1. Topsoil	1.3ha area topsoil to be removed to berms	1.3ha @ 15cm deep = 1950m ³	Permanent	Definite	Moderate
5.14.2. Land Capability	1.3ha area available for cultivation or as wilderness	1.3ha	Permanent	Definite	Insignificant
5.14.3. Vegetation	Will be seeded with vegetation	1.3ha	Permanent	Definite	Insignificant
5.14.4. Animal Life	Habitat returned	Minor	Permanent	Definite	Insignificant
5.14.5. Noise	Earthmoving equipment	Local	During construction	Definite	Insignificant
5.14.6. Air Quality	Dust generated by earthmoving equipment	Local	During construction	Definite	Insignificant
5.14.7. Hydrocarbons	Possible oil/fuel; leak from earthmoving equipment/vehicles	Local	On execution until cleaned	Possible	Insignificant
5.15. Retain stormwater management system					
5.15.1. Land Capability	Enables more effective revegetation through prevention of erosion	Mining right area	Until revegetated	Definite	Insignificant
5.15.2. Surface Water	Elimination of potential siltation of stream below site	Mining right area	Until revegetated	Definite	Insignificant
5.16. Retain access roads for future use					
6. AFTERCARE PERIOD					
6.1. Maintain stormwater management system					
6.1.1. Land Capability	Enables more effective revegetation through prevention of erosion	Mining right area	Until revegetated	Definite	Insignificant
6.1.2. Surface Water	Elimination of potential siltation of stream below site	Mining right area	Until revegetated	Definite	Insignificant
6.2. Remove alien vegetation (if applicable)					
6.3. Conduct supplementary seeding if necessary					

Activity	Nature of impact	Extent	Duration	Probability	Significance
6.4. Conduct final performance assessment					
6.5. Lodge closure Application					

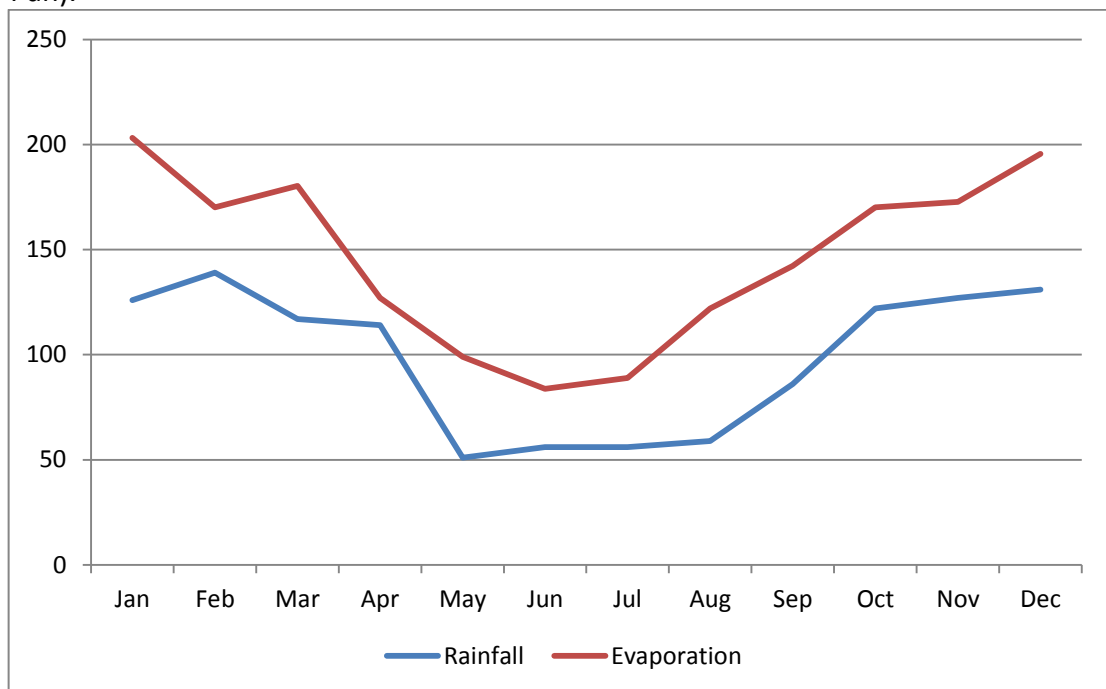
Table 5: Classification of potential impacts

4.6.1 Further considerations in assessing impacts of specific aspects:

4.6.1.1 Dust Reduction Processes

Climate's role in dust generation

The Richards Bay/Empangeni area has an average annual rainfall of over 1 140mm per annum (WB40) and evaporation rate of 1700mm per annum (WB28, A-Type Pan).



The chart above shows that despite the fairly high rainfall, the evaporation rate always exceeds rainfall. This in theory provides high potential for dust generation, but the differential is small compared to most of the country and although there is potential for dust, such dust generation will be relatively low in these climatological conditions.

The other climatological element which has a massive bearing on dust generation and dispersal is the wind regime. The wind rose for Richards Bay area is shown in para 5.2. It shows predominantly S-SW winds and North North East winds. There is surprisingly little difference between the summer and winter windroses with the

only main difference being that the winter winds blow more directly from the north and south.

Considerations in Assessing Dust Impact

Potential impact is primarily assessed in respect of identified potential dust recipients namely:

Structure / Use	Distance & Direction <u>from</u> Primary crusher position	Distance & Direction <u>from</u> closest point of excavation
Ndabayekhe Community residences	685m west of crusher	270m west
Grey water tower	650m west	250m west
Closest labourers cottages	780m east	680m east
Current managers house- to be converted to office	880m SSW	320m SW
Powerline	330m east of plant	370m east

Dust impact is typically dependant on:

- Dust generation at source
- Rainfall
- Wind speed, direction and frequency (percentage blowing in a specific direction)
- Topographical controls (funnelling of wind and associated dust along valleys, and other topographical features)
- Attenuation by retained surrounding trees lines. These trees reduce wind speed resulting in reduced dust generation off denuded surfaces and reduced dispersion.

While paragraph 4.6.1 further below deals with methods of limiting dust at source, the quarry surroundings reveals the following features which will control / exacerbate dust generation and distribution.

(a) Rainfall

Dust monitoring under S.P.C. assessment (at other sites) revealed that the single-most important factor in dust generation and control is **WATER** given that the monitoring results showed reduction of dry dust levels to levels of total insignificance.

In Pentlands Quarry’s case, the average rainfall is quite high at 1140mm per annum. The statistics (WB40) show rainfall for 130 days per year, with 34 of these rainy days that exceed 10mm rainfall. Despite the higher than national average rainfall, the excessive evaporation rate suggests that control of dust by the operators would probably be required and must take place especially if dust generation does result in any impact or nuisance effect on surrounding land use or users⁸.

⁸ Dust must in any event be kept low from a health and safety point of view (and legislation).

(b) Wind

Figure 12 superimposes the windrose onto surrounding land use base plan. The following factors are important to note when reading this plan:

- 1) The wind rose is centred on the plant/ primary crusher which is generally regarded as the highest dust generating centre at any quarry
- 2) The area shaded yellow represents a dust plume. This is a theoretical dust plume based on an assumption that the strongest wind would carry dust 1000m from the primary crusher. As will be shown below in the text the 1000m distance assumed is a very liberal distance and dust will not have any impact at this distance.
- 3) Even at the 1000m assumption, there are no surrounding land uses (except agriculture) which would be impacted upon under these conditions

The following historical / empirical studies have a bearing on the dust generation:

- It is noted through monitoring of dust levels at Grabouw Quarry in the Western Cape (under significantly more vigorous wind condition) that dust fall out of up to 600mg/m²/day occurs up to distances of 500m even with dust attenuation measures well managed. The only exception to this will be under wet conditions when dust levels (as witnessed in Grabouw) do not even reach 300mg/m²/day in close proximity to the source under normal management control.
- The scale of the wind resultant (i.e. distance of dust transfer) is based on Grabouw quarry observation and monitoring which reflects that dust levels under properly managed conditions will be controlled to within the 600mg/day residential limit at 500m downwind under strong winds. Grabouw (and other) studies furthermore reveal that in the light wind downwind directions dust is not carried in excess of 300m from the plant.
- The diagram below shows a max distance plume of 1km from the crusher which distance is well in excess of any dust impact as a result of quarrying at this scale or nature.

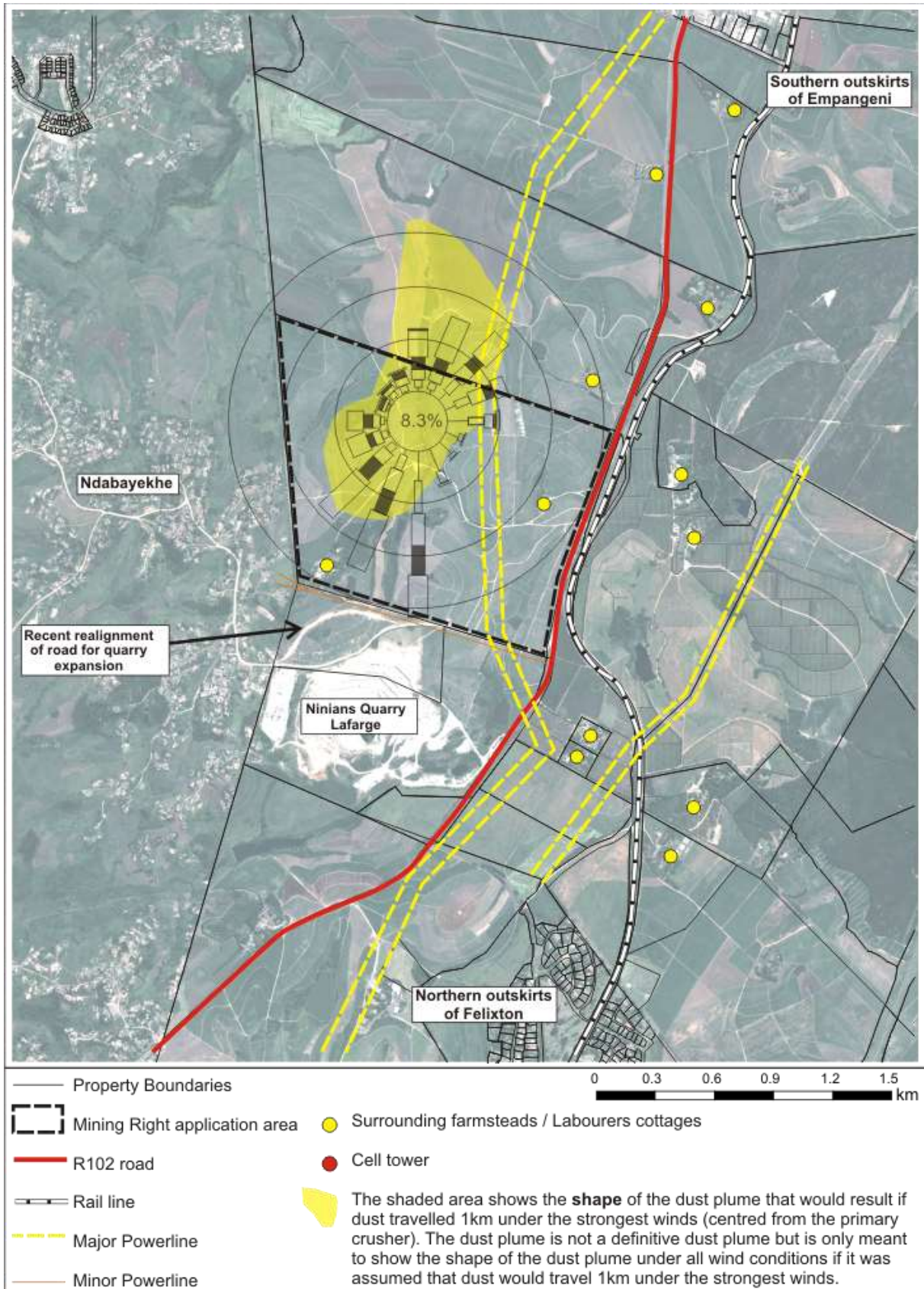


Figure 12: Wind generated dust plume centred on Primary Crusher

(c) Topographical Control

The site is located in a generally higher lying area (which is normally subjected to more intense winds), however in this case the operation is located within a fairly protected amphitheatre with the plant and facilities located low in the amphitheatre allowing for topographical control of dust dispersion.

Dust Dispersion and Expected Dust Levels Based on Other Monitored Sites

(a) Point of Departure in the matter

Both observation and dust monitoring statistics of fall-out dust at especially Palmiet Quarry in Grabouw and Bridgetown Quarry at Moorreesburg show that:

- (i) The main source of dust is the crushing plant and its immediate manoeuvring area.
- (ii) Water (mist sprays and sprinkler systems) is the most effective dust control mechanism.
- (iii) Without effective dust control at source dust generation levels are so excessive that extremely high impacts would result even on distant land uses (i.e. but less than 1km) and in any event such levels of dust would not be allowed within the working environment at the quarry. (Mine Health and Safety Act).
- (iv) After implementation of dust control measures, plant/stockpile loading generation of dust seldom exceeds the residential area **limit** of 600mg/m²/day at the short distance of 250m downwind of the plant and will therefore not exceed acceptable limits.

Dust generation impact table

Dust generation as a result of the proposed project will be through the following:

Activity	Extent	Significance	Probability	Timing	Duration / Status
Traffic generated dust along portions of access /delivery road	Along unsurfaced sections of access road	Insignificant	Likely	On occurrence	Until tarring of access road / negative
Topsoil removal (occurs rarely)	Local / site only	Insignificant	Definitely	On occurrence	Intervals for short periods / Negative
Drilling operation	Local / site only	Insignificant (with dust extraction equipment)	Definitely	On occurrence (Often)	Two weekly intervals for up to 4 days / Negative
Blasting (1 x per month)	Local / Farm and surrounds	Moderate	Definite	On occurrence	Life of mine / episodic/ negative
Loading and hauling of shot rock	Local / Excavation only	Insignificant	Definite	On occurrence	Life of mine / periodic/ negative
Crushing and screening	Local / Farm and surrounds	Moderate	None with dust suppression	During plant operation	Life of mine / Negative
Dust off denuded areas	Local / Farm and surrounds	Insignificant	Likely	Under high winds	Life of mine / Negative

Attenuation measures to be implemented

Note further that in addition to the measures described below, **dust must be continually monitored and analysed**. This allows for an assessment of import / export fall-out dust quantification (in other words, the dust generated by the quarry can be quantified as well dust generated by other sources in the area) and standard services include the regular sample collection, filtration and data analysis as well as data reporting of the findings (Monthly Fallout & Trends Analysis).

The following is a list of measures that must be implemented at the quarry to prevent any impact of dust on surrounding land uses or users.

Activity	Attenuation Measure(Internal)
Traffic along portions of access roads	<ul style="list-style-type: none"> • Water cart wetting of the road must occur during dry and / or windy conditions.
Use of unsurfaced roadways	<ul style="list-style-type: none"> • Water cart wetting of roads during dry and / or windy conditions • Install permanent sprinkler system on long term routes such as haul roads
Topsoil removal	<ul style="list-style-type: none"> • Pre-wet topsoil • Avoid high wind conditions • Schedule in the wet season
Drilling	<ul style="list-style-type: none"> • Supply masks where applicable. • Fit dust extraction equipment to drill rigs
Blasting (Excavation Advance)	<ul style="list-style-type: none"> • Avoid blasting under extreme winds. • Apply best available blasting practice
Hauling	<ul style="list-style-type: none"> • Wet haul road with water cart but preferably permanent sprinkler system
Primary Tipping and Crushing	<ul style="list-style-type: none"> • Semi-enclosure of hopper. • Install mist spray system at primary intake hopper. • Install dust extraction plant to bag filters on all crushers as a last option • Supply masks where applicable for employee health protection
Screening	<ul style="list-style-type: none"> • Supply masks where applicable for employee health protection • Screens and crushers to be housed. • Mist sprays at transfer points and on stockpile product walls. • Dust extraction equipment to be fitted to plant as last option
Transfer points	<ul style="list-style-type: none"> • Apply mist sprays at all belt transfers and screens. • Enclose transfer points.
Stockpiling	<ul style="list-style-type: none"> • Wall stockpiles where ever possible • Provide sprinkler systems on walled or other stockpiles where wetting of product can take place
Loading and despatch	<ul style="list-style-type: none"> • Sprinkler wet stockpile to maintain moisture content • Cover delivery trucks carrying dust generating loads
Monitoring of dust	Continuous monitoring of dust levels in the expected impact vector must take place.

4.6.1.2 Blasting Considerations

Blast noise:

In case of blast noise, the following attenuation measures must be put in place should such impact arise / result in complaints. Note that such impact would in any event be nuisance impact and will not materially impact any surrounding land user:

1. Generate a database of surrounding land users with contact details and inform them timeously when blast is expected to take place
2. Always blast at same time of day

3. Avoid high wind conditions, low cloud cover and temperature inversions (afternoons are usually best)

Blast Vibration:

The following information is quoted directly from a report on Vibration measurement and control (Mohamed, 2010).

The ground vibration can be affected by certain blast design parameters:-

- (i) The maximum instantaneous charge or MIC is the amount of explosives fired at the same moment in time.
- (ii) The number and frequency of delays. The introduction of a delay sequence can reduce the size of the maximum wave produced.
- (iii) The height of the working bench and therefore the length of borehole.
- (iv) The number of "decks" or layers of explosives and detonators in each hole.
- (v) The spacing, burden and number of holes, in the blast ratio.
- (vi) The diameter of the shot hole, which will affect the amount of explosives used.

There are several steps an operator can take to reduce ground vibrations:

Blast design

Use a blast design that produces the maximum relief practical in the given situation. Explosions in blast holes which have good relief – i.e. those having nearby free faces – produce less ground vibration. The use of delay blasting techniques establishes internal free faces from which compressional waves produced later in the blast can delay patterns, maximum relief can be retained.

In general, when blasting multiple row patterns, greater relief can be obtained by using a longer delay between rows than between the holes within a single row. A delay of at least 2–3 ms/m of burden between the holes within a row is recommended for the necessary relief and best fragmentation.

Use a spacing/burden ratio greater than one. The presence of weak seams or irregular back break may dictate the local use of a spacing/burden ratio close to one.

Hole straightness

Control drilling of blast holes as closely as possible. Establish bench marks for use in setting out the hole locations for the next blast before each blast in order to help avoid possible errors due to irregular back break.

Subdrilling

Restrict the amount of sub drilling to the level required to maintain good floor conditions. Typical sub drilling for holes inclined 3:1 is 30% of the burden at floor level. Tape each drill hole and match it to the face height. If hole depth is greater than intended, backfill with drill cuttings or crushed stone. Excessive sub drilling can increase vibration because of the lack of a nearby free face to create reflection waves.

Charge per delay

Use the following techniques to reduce charge weight per delay and, therefore, peak particle velocity.

- reduce hole depths with lower bench heights and increase specific drilling,
- use smaller diameter holes,
- subdivide explosive charges in holes by using inert decks and fire each explosive deck with initiators using different delays,

- Use electronic or mechanical timers to increase the available number of periods of delay electric blasting caps and to increase timing flexibility. Non electric delays coupled with surface delay connectors can provide similar flexibility.

Explosives

Eliminate or reduce hole-to-hole propagation between charges intended to detonate at different delay periods. Use explosive, such as water gels, which are much less sensitive than dynamite to hole -to-hole propagation. Hole-to-hole propagation occurs when the explosive charges or blastholes are only a few feet apart, as in trenching, decked holes, or underwater excavations, or at greater distances when blasting interbedded soft and hard layer rock, such as coral or mud-seamed rock, that is saturated with water.

Using NONEL blasting system

Use NONEL blasting system can reduce the wave superposition by increasing delay time among shots. In addition to reduce the air vibration by using NONEL shock tube instead of detonating cord.

Air overpressure

There are five principal sources of air overpressure from blasting at surface mineral workings:

- (i) The use of detonating cord which can produce high frequency and hence audible energy within the air overpressure spectrum.
- (ii) Stemming release, seen as a spout of material from the boreholes, gives rise to high frequency air overpressure.
- (iii) Gas venting through an excess of explosives leading to the escape of high-velocity gases, give rise to high frequency air overpressure.
- (iv) Reflection of stress waves at a free face without breakage or movement of the rock mass. In this case the vertical component of the ground-vibration wave gives rise to a high-frequency source.
- (v) Physical movement of the rock mass, both around the boreholes and at any other free faces, which gives rise to both low and high-frequency air overpressure.

The steps to reduce air vibrations:

Detonating cord should be used as sparingly as possible, and any exposed lengths covered with as much material as possible. Just a few feet of exposed cord can lead to significant amounts of audible energy and, hence, high air overpressure levels.

Stemming release can be controlled by detonation technique, together with an adequate amount of good stemming material. Drill fines, while readily available, do not make good stemming material. The use of angular chippings is better. It should be noted however that detonation cord and stemming release have been virtually eliminated with the use of in hole initiation techniques.

Gas venting results from overcharging with respect to burden and spacing or, perhaps, a local weakness within the rock, and is also typified by the occurrence of fly rock. Its control is essential for economic and safe blasting, and is considerably aided by accurate drilling and placement of charges, together with regular face surveys.

The controllable parameters such as geology, Topography, and Meteorological Conditions can be controlled to some extent by adjustment of blast pattern and blaster in charge judgment for blasting operation.”

Flyrock:

Flyrock has the potential to result in significant impact including fatal accidents. Modern blasting practice however allows for blast design planning to accurately determine the charge per hole and delays required for a specific exclusion zone. This blast design description does not fall within the ambit of this documentation but must be conducted by the blasting professional and in the case where facilities / communities are located within 500m, then such blast design is presented to the DMR for their approval.

The following factors are generally regarded as the cause of (excessive) flyrock:

1. Holes loaded with excessive explosives
2. Inadequate burden
3. Incomplete or poorly conducted hazard assessment prior to blasting
4. incomplete checking of hole placement and geological changes of the rock mass
5. No clear supervision for the whole blasting activity

So, to reduce the chance of uncontrolled flyrock, the following should be undertaken ((ZHOU Zilong, 2011):

1. Ensure that all blast holes are loaded with the proper amount of explosives
2. Ensure effective blast design.
3. Perform a complete hazard assessment prior to blasting.
4. Check all hole placements and look into geological changes of the rock mass.
5. Ensure that profile methods are applied where there is a potential for drill wander due to cracked ground.
6. Establish clear lines of responsibility, supervision and communication for the whole blasting activity. The blaster should talk to the driller to determine the condition of the boreholes before loading them with explosives.
7. Establish, review and enforce written safe work procedures for all blasting operations
8. Ensure that all persons associated with the blasting activity are properly trained.
9. Give careful consideration to the blast orientation (i.e. quarry face) to ensure the blast occurs in a safe direction.
10. Where unexpected events occur, determine the causes and take appropriate action.
11. As well, to guard against unexpected flyrock, blasters should:
 - a. Predetermine the danger area and clear everyone from the danger area.
 - b. Protect themselves and others from the threat of possible flyrock with adequate blasting shelters.

4.7 Provide a description of potential cumulative impacts that the proposed operation may contribute to considering other identified land uses which may have potential environmental linkages to the land concerned.

The assessment of cumulative impacts on a site specific basis is often a complex operation. The aim of this impact analysis is ultimately to determine at which point the combined impacts from several operations (similar or dissimilar) in the area will affect the environment or part thereof to such a negative degree that the project should not be allowed to proceed.

Always remember that mining is a place-bound operation (as opposed to say a housing development which is less dependent on geology or other factors).

The following is an amended procedure sourced from http://www.eiatoolkit.ewt.org.za/documents/DEAT/guidelines/EAT_EIA_Guideline5_Assessing_alternatives_and_impacts.doc

4.7.1 Types of cumulative impacts

Additive impact: Impacts of the same nature from different operations (e.g. excessive groundwater abstraction from several operations in the same area result in a severe drawdown effect)

Interactive impact: where a cumulative impact is the result of a combination of different impacts to cause a new kind of impact. This kind of impact can be:

- Countervailing – the net adverse effect is less than the sum of the individual impacts (e.g. pumping clear water into a polluted water resource).
- Synergistic – when the impacts work together to develop a sum of different impacts results in an impact which is greater than the individual impacts.

4.7.2 Methodology used in assessing cumulative impact/s

Determine extent of cumulative impacts:

- Identify potentially significant cumulative impacts associated with the proposed activity
- Establish the geographic scope of the assessment
- Establish the timeframe of the analysis
- Identify other activities affecting the environmental resources of the area

Describe the affected environment:

- Characterise the resources identified above in terms of their response to change and ability to withstand stress
- Define a baseline condition that provides a measuring point for the environmental resources that will be acted upon

Assess the cumulative impacts:

- Determine the magnitude or significance of cumulative impacts

Recommend mitigation measures.

So, using the aforementioned procedure as headings, herewith an assessment of the cumulative impacts arising from this operation:

4.7.2.1 Determining the extent of the cumulative impacts:

4.7.2.1.1 Identification of potentially significant impacts:

The proposed operation could conceivably result in the following cumulative impacts. Lafarge in their letter email dated 05/07/2013 (in Annexure C) list noise, dust, water and Socio economic cumulative impact as possible cause of concern:

Vegetation: No natural vegetation remains on the proposed mining site, but in theory such vegetation could be restored after agriculture. Note that such vegetation will be restored after mining with perhaps an altered habitat type as a result of the pit. This impact is not considered significant and is not considered further.

Noise: The applicants have no knowledge of the impact of Ninians quarry in respect on noise. The applicants will attempt to gather information from Ninian's operators in this respect so that more qualitative impact can be determined. However, the Pentlands site is located beyond a ridgeline to the adjacent community and such topographical barriers are extremely effective in reducing noise impact. It is likely that the only noise impact of any significance will be the noise generated by blasting. It is unknown how often blasting takes place at Ninians quarry, but Pentlands quarry will add one blast per month. Surrounding communities will be specifically asked of their experience of noise impact from Ninians quarry during the ongoing public participation to determine the cumulative impact.

Dust: As for noise, it would be required that the ongoing public participation consult with surrounding landowners and communities to determine their perception of dust impact from Ninians quarry as well as empirical studies from Lafarge (if they would provide such documentation). But as for noise it is expected that such impact will in any event be insignificant on a cumulative basis.

Surface water quality: The two quarries are currently in different water basins and there will be no cumulative impact in this regard.

Socio-economic impacts: Possibly the most significant impact is the impact on socio-economics. The positive impacts of the quarry as a standalone quarry are clear and have been described in para 2.8 and

4.5.3. However, the questions to be answered in this case is would the proposed quarry result in drop in sales at surrounding quarries to result in retrenchments and other socio-economic impacts to occur and if it did, would such negative impact be larger than the impact generated by the proposed new quarry. Such question will be explored as part of the ongoing public participation and will be fully reported on in the upcoming EIA / EMP.

Agriculture: Impact will arise through the *permanent* loss of ±12.2ha of sugar cane lands as a result of the excavation. Cumulative losses have occurred as a result of other industrial land uses in the area including the Ninians quarry to the south. Currently, the farm produces some 70t/ha at about R400/ton per year. That means a loss of 850 tons per annum⁹ and loss of income of around R350 000 per annum at current market rates.

4.7.2.1.2 Geographic Scope of assessment:

Impact aspect	Geographic scope
Dust	Local area (Including community to the west)
Noise	Local area (Including community to the west)
Surface water quality	Quaternary catchment basin feeding the Mpangeni River
Socio-economic	Local Municipal area and surrounding commercial quarries
Agriculture	12.2ha (but must be considered against other losses)

4.7.2.2 Timeframe of analysis

The proposed project will take place over a period of approximately 44 years. The timeframe of the analysis would typically depend on the nature of the impact being assessed. In this case, given the limited extent (temporally and spatially) of the project, only the lifespan of the operation from approval to the end of the aftercare period and closure certification will be considered (as there are NO residual impacts, provided rehabilitation takes place in accordance with the prescriptions of the EMP)

4.7.2.3 Other activities impacting on environmental resources in the area

Other activities affecting the environment in the area are as follows:

- Surrounding mining (of both aggregate and heavy minerals)
- Agricultural development
- Industrial development (Richards Bay and to a much lesser degree Empangeni are industrial hubs in national context)

⁹ South Africa is the 11th largest sugar producer and produces some 2.2million tons of sugar per annum (Source: <http://www.syngenta.com/country/za/en/crops-and-products/key-crops/Pages/SugarCane.aspx>)

- Infrastructure development: Roads, Eskom powerlines and substation, pipelines are historical impacts that now form a permanent feature on the landscape.

4.7.2.4 Resource characterization

This section aims to characterise the environmental resources in terms of their ability to withstand additional stress.

Noise: The noise impacts that do occur on the communities to the west of the Ninians quarry and the proposed quarry are unlikely to originate from the existing and proposed quarry given both the favourable wind regime and topographical controls. The only additional impact is likely to be the one extra blast per month.

Dust: Similarly for dust.

Surface water quality:

There is at present only agricultural impact on water quality (and quantity). The proposed quarry will use similar volumes of water that irrigation would require and no siltation of the stream will take place (as may occur after ploughing), nor will there be any fertiliser ingress into the stream. The net result is that the quarry may in fact result in improvement of water quality to downstream users.

Socio-economic conditions:

There are 2 aspects to the Socio economy that have a bearing. One of them can be quantified at this stage whilst the 2nd needs further study (and will be reported on in the upcoming EIA / EMP)

- Unemployment is high. Any job opportunities and positive socio-economic spin offs through mining (social and labour plan) cannot be underestimated
- Impact on surrounding commercial aggregate quarry to yet be fully determined.

4.7.3 Baseline status

Full baseline status of each of the impacts is described in Part 2 of this text.

4.7.4 Magnitude and significance of cumulative impacts

Water quality:

Possibly positive but insignificant.

Noise:

Unlikely to be any additional impact. Impact will be insignificant.

Air Quality:

Unlikely to be any additional impact. Impact will be insignificant.

Socio-economic:

- Moderate positive impact in the case of surrounding communities

- Unknown impact on surrounding aggregate quarries (to be assessed and included in upcoming EIA/EMP).

4.7.5 Mitigation measures

Mitigation measures for each of these elements will be described after public participation in upcoming EIA / EMP.

5 Land use or development alternatives, alternative means of carrying out the proposed operation, and the consequences of not proceeding with the proposed operation.

5.1 Provide a list of and describe any alternative land uses that exist on the property or on adjacent or non-adjacent properties that may be affected by the proposed mining operation.

Alternative land uses on site

The site is currently use as sugar cane production.

Alternative land uses adjacent to site

The land uses adjacent to the site have been very entrenched over the past decades and is unlikely to change. Surrounding land use is described in para 3.3 and 3.4.

5.2 Provide a list of and describe any land developments identified by the community or interested and affected parties that are in progress and which may be affected by the proposed mining operation.

None.¹⁰

5.3 Proposed eventual land use (subject to public participation)

5.3.1 Intended Use

While the process of EIA and EMP will consider each environmental element within the context of quarrying it is important up-front to bear in mind that these impacts will be considered within the chosen post-mining land use as a waterbody within a rehabilitated surrounding which is suitable to serve as either a diversified ecology, an eco-educational facility or recreational facility surrounded by agricultural lands.

5.3.2 Illustration of the Concept

This such post-mining land use concept is best illustrated by the photographs below which reflect what has been achieved in the rehabilitation of the dolomite hard rock Glen Douglas Quarry (Gauteng) Section A which serves as a recreational and

¹⁰ Remember, as described in part 6, that limited public participation has taken place to date. Full public participation reporting will be contained in the EIA /EMP

conferencing facility known as Bass Lake and provides both biodiversity and sustainable employment.



Photo 6: Post mining land use

5.3.3 Methodology to Achieve this End-Use

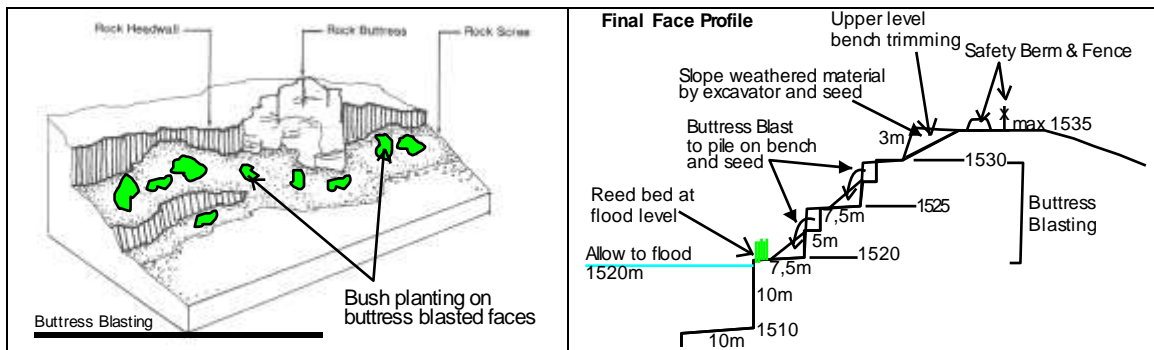
In order to achieve the stability, visual appearance and environmentally productive post-mining use of the waterbody and its surrounds as seen in the photos above, it is imperative to:

- (i) Provide sufficient perimeter width around the intended excavation to allow sufficiently broad final perimeter benches to accommodate the buttress blasting and face splitting required to achieve stability, a varied face appearance and low enough faces to be screened in revegetation of the benches.
- (ii) To implement the British Method of Buttress Blasting as promoted in the HMSO Publications which include the following illustrations of the method.



Photo 7: Buttress Blasting in practice Reproduced under permission of HMSO

- (iii) Required profiling.



(iv) Details elements of the Post-Mining Land Use.

The following elements must be embodied in this post-mining land use:

- Conferencing / eco-educational / recreational centre
- Revegetated buttress blasted split faces and slopes
- Productive shallow water reedbed fringe to ensure quality of the waterbody
- Shallow beach area

5.4 Provide a list of and describe any proposals made in the consultation process to adjust the operational plans of the mine to accommodate the needs of the community, landowners and interested and affected parties.

None yet¹¹.

5.5 A description of the most appropriate procedure to plan and develop the proposed mining operation. The applicant must:

5.5.1 Provide information on its response to the findings of the consultation process and the possible options to adjust the mining project proposal to avoid potential impacts identified in the consultation process.

To date no options have required consideration. Should such considerations come to light, then they will be highlighted in the upcoming EIA and EMP.

5.5.2 Describe accordingly the most appropriate procedure to plan and develop the proposed mining operation with due consideration of the issues raised in the consultation process.

The further public participation process will consist of the following phases:

1. Notification to parties and calls to register as I&AP through registered letter, email or fax to identified persons/organisations, newspaper advert to inform

¹¹ Remember, as described in part 6, that limited public participation has taken place to date. Full public participation reporting will be contained in the EIA /EMP

broader public, call for them to register as I&AP and invitation to attend Public Open Day – Done – Refer Annexures A and B.

2. The Scoping report will be sent to all registered I&AP's and will be made available on a website.
3. Distribution of Scoping report to State departments (by DMR)
4. Holding of Public Open Days
5. Receipt of all comments
6. Tasking of specialists to complete their studies (if required)
7. Receipt of specialist studies (if required)
8. Compilation of EIA / EMP for delivery to DMR before due date

The process outline above will provide opportunity for all parties to give their input into a document which will therefore consider all aspects and issues and adjust the proposed mining project as required.

6 A description of the process of engagement of identified interested and affected parties, including their views and concerns

NOTE: Only limited public participation can be conducted in the 30 days required to publish the Scoping report. Such participation in this case has consisted of:

1. Identification of expected I&AP's and correspondence to them by email or registered mail. Telephonic introductions have taken place with almost all of these identified parties.
2. Newspaper advert informing broader public of project, invitation to register as I&AP and invitation to Public Open Day
3. All correspondence was accompanied by Background Information Document

6.1 Provide a description of the information provided to the community, landowners, and interested and affected parties to inform them in sufficient detail of what the mining operation will entail on the land, in order for them to assess what impact the mining will have on them or on the use of their land.

During the initial stages of the consultation process, a Background Information Document (based loosely on EMP content) was used as information for the I&AP's. Such 91 page document is too large to be included here but can be provided on request and is still available on website www.siteplan.co.za. Such document accompanied all correspondence to date. Note that most of the information contained in this report in respect of existing environment and expected impact was contained in the BID.

From this point forward, this Scoping report will be made available as a document for comment.

6.2 Provide a list of which of the identified communities, landowners, lawful occupiers, and other interested and affected parties were in fact consulted.

The following parties have thus far been contacted and will continue to be consulted as is necessary – Refer Annexure B for correspondence sent and Annexure C for correspondence received thus far:

- 1) Landowner – through telephone call and email. He has despatched the information for legal advice but is in constant contact and is satisfied that quarrying goes ahead provided suitable agreements are in place with the applicants
- 2) All adjacent landowners were contacted by telephone and email
- 3) Municipality: Municipal Manager and head of Environmental / Development Section have been sent registered letters as well as Email.
- 4) Ezemvelo KZN wildlife
- 5) In addition to the landowner and other registered I&AP's, the following parties were sent copies of the BID report for their comment:
 - a. WESSA – see their response received in Annexure _
 - b. Applicable Ward Councillors (Wards 9, 23, 24 and 29). The proposed quarry is in Ward 23.
- 6) In terms of surrounding infrastructure, the BID was dispatched to Eskom and SASOL – Both parties have responded.
- 7) The application has been advertised in 5 local and regional newspapers:
 - Zululand Observer
 - Zululand Fever
 - Umlozi Wezindaba
 - Isolezwe
 - iLangaSuch advert did serve as notification of application; serve as call to register as Interested and Affected Party and invitation to Public Open Day – Refer Annexure A for content of advert in English and Zulu.
- 8) SAHRA will be sent a copy of this scoping report through their online SAHRIS system
- 9) Surrounding community will be consulted at a personal level during the Public Open Days

The process of locating Interested and Affected parties will continue with persons / organisations having opportunity to become I&AP's through the process until "final "

EMP is lodged with the DMR. Note that Public Open Days have been advertised for 23 and 25 July 2013 in Empangeni Library and Ngwelezane Community Hall.

6.3 Provide a list of their views in regard to the existing cultural, socio-economic or biophysical environment, as the case may be,

This far the only responses received have been:

- The landowner has responded via telephone (08/07/2013) to say that he has referred the matter for legal advice but is in principle not opposed to the application
- Eskom(as acknowledgement of receipt) and forwarding to responsible person in their department
- WESSA to state that they do not comment on individual applications any longer- only at a strategic level
- SASOL to state that the quarry will have no impact on their gas pipeline
- Lafarge as operators of adjacent quarry have also responded with further requirements

Copies of all responses received to date are included in Annexure C

The EIA /EMP will contain full issues tracking and resolution attempts.

6.4 Provide a list of their views raised on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed mining operation;

The EIA /EMP will also contain full issues tracking and resolution attempts.

6.5 Provide a list of any other concerns raised by the aforesaid parties.

The only concern thus far has been from the operators of the quarry to the south (i.e. Lafarge).

6.6 Provide the applicable minutes and records of the consultations.

Refer Annexures A-C for copies of newspaper advert, correspondence sent and correspondence received.

6.7 Provide information with regard to any objections received.

None yet.

7 Describe the nature and extent of further investigations required in the environmental impact assessment report including any specialist reports that may be required,

At this stage it appears that the following applies. Please note that this may be argued against by State Departments and other NGO's:

1. No botanical impact assessment will be required given agricultural land use
2. No Archaeological or Palaeontological Impact Assessments should be required given previous disturbance and geology.
3. No groundwater impact assessment should be required until renewal in 25 to 30 years' time given lack of water intersected in prospecting drilling, landowner comment and comparison with surrounding excavation.
4. It may be required that specialist Socio-economic assessment be conducted to determine impact on agriculture and surrounding quarries.

IDENTIFICATION OF THE REPORT

The report on the results of consultation must, at the end of the report include a Certificate of identification as follows:

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises the results of consultation as contemplated in Section 16 (4) (b) or 27 (5) (b) of the Act, as the case may be.:

Full Names and Surname	CT Myeni
Identity Number	6404130329087